SECOND FIVE-YEAR REVIEW REPORT FOR

DEL MONTE CORPORATION (OAHU PLANTATION) SUPERFUND SITE

HONOLULU, HAWAII

PREPARED BY

US Army Corps of Engineers, Seattle District
for
U.S. Environmental Protection Agency
Region IX
San Francisco, California

Approved by:

Angeles Herrera, Assistant Director
Superfund Division
Federal Facilities and Site Cleanup Branch
U.S. Environmental Protection Agency Region IX

Date:

September 14, 2015

Executive Summary

This is the second Five-Year Review (FYR) of the Del Monte Corporation (Oahu Plantation) Superfund Site (Site) located in Kunia, Hawaii. The purpose of this FYR is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this FYR was the signing of the previous FYR on June 14, 2010.

The Site is a former 6,000-acre pineapple plantation located on the north-central plateau of the Island of Oahu. The Site is located near Kunia Village, Honolulu County, Hawaii. Del Monte Fresh Produce (Hawaii) Inc. (Del Monte) grew and processed pineapple on the plantation from about 1946 to November 2006. During that time, a number of pesticides (soil fumigants) were applied to the soil to control nematodes (worms) that attack pineapple roots. These fumigants were stored, mixed, and spilled in an area near the Kunia Well, a former drinking water supply well. Fumigants spilled in the area have contaminated shallow (20 feet to 100 feet below ground surface) subsurface soil and perched groundwater, as well as deep basal groundwater. Constituents of concern (COCs) in soil and groundwater are ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP), 1,2-dichloropropane (1,2-DCP), and 1,2,3-trichloropropane (1,2,3-TCP).

EPA determined that the pesticides EDB, DBCP, 1,2,3-TCP, and 1,2-DCP have been released into soil and perched groundwater at the Site, and that a substantial threat of release to basal groundwater exists.

In 2003, EPA selected a two-part remedy for the perched aquifer and deep soils and for the basal aquifer.

Perched Aquifer and Deep Soil Remedy:

- Extracting contaminated groundwater from the perched aquifer and treating the water using vegetation.
- Placing a vegetated soil covering over the contaminated soil area. The soil cap will reduce the amount of rainwater that moves through the soil and carries contaminants.
- Installing a soil vapor extraction system to withdraw contaminants present in vapor form from the soil. The extracted vapor will be treated with a carbon filter to remove the contaminants before the vapor is released to the atmosphere.
- Restricting land use to prevent exposure to contaminated soil and perched groundwater impacted by COCs and to prevent activities that might interfere with the effectiveness of the remedy.

Basal Aquifer Remedy:

- Installing monitoring wells to characterize the extent of contaminated groundwater in both the source area and the downgradient plume.
- Extracting and treating contaminated groundwater in a phased manner, starting at the Kunia Well.
- Monitoring the effectiveness of source control and evaluating whether natural attenuation is effective at reducing contaminant concentration in the downgradient plume to drinking water standards.
- If monitoring data show no evidence of natural breakdown, install additional extraction wells to ensure the entire plume is captured and treated.

- Treating the contaminated groundwater to drinking water standards using air stripping and carbon adsorption.
- Using treated water for irrigation.
- Restricting land use to prevent exposure to basal groundwater impacted by COCs and to prevent activities that might interfere with the effectiveness of the remedy.

Groundwater monitoring, extraction, and treatment for the perched aquifer started in 1998 as part of the phytoremediation treatability study. In 2008, modifications were made to improve the system performance and combine groundwater extraction with soil vapor extraction. The Kunia Well Treatment System was designed in 2003, constructed in 2005, and has been operating since 2005.

Based on the data and documents reviewed, institutional controls, site inspections, and the interviews, the remedy for the Site is mostly functioning as intended by the Record of Decision. The Remedial Action Objective (RAO) that requires restoring the basal groundwater to its beneficial use of drinking water supply within a reasonable timeframe cannot be met because background concentrations of EDB, DBCP, and 1,2,3-TCP are above maximum contaminant levels (MCLs). SVE in the perched aquifer and deep soil is not removing mass as expected in the ROD.

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy, and no changes to the Applicable or Relevant and Appropriate Requirements have been identified that would affect the protectiveness of the remedy. There have been minor changes in toxicity factors for the COCs, but these do not impact the RAOs or the protectiveness of the remedy since the remedy is based on Federal and State of Hawaii MCLs.

The remedy at the Del Monte Corporation (Oahu Plantation) Superfund Site currently protects human health and the environment because there is no complete exposure route to untreated perched or basal aquifer groundwater and there are institutional controls included in the deed restrictions to prevent exposure until the groundwater meets the MCLs. However, in order for the remedy to be protective in the long-term, an evaluation of the impact of background concentrations on current RAOs should be performed, and the perched aquifer and SVE performance criteria should be evaluated.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Del Monte Corporation (Oahu Plantation)		
EPA ID: HID980637631		
Region: 9	**State:** HI	**City/County:** Kunia/Honolulu

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" was selected above, enter Agency name:** Click here to enter text.
Author name (Federal or State Project Manager): Christopher Lichens
Author affiliation: EPA Region 9
Review period: 09/24/2014 – 06/14/2015
Date of site inspection: 01/26/15
Type of review: Statutory
Review number: 2
Triggering action date: 06/14/2010
Due date *(five years after triggering action date)*: 06/14/2015

Five-Year Review Summary Form (continued)

Issues/Recommendations				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): N/A	**Issue Category: Remedy Performance**			
	Issue: The Remedial Action Objective that requires restoring the basal groundwater to its beneficial use of drinking water supply within a reasonable timeframe cannot be met because background concentrations of EDB, DBCP, and 1,2,3-TCP are above MCLs.			
	Recommendation: Evaluate the impact of background concentrations on current RAOs.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	November 2016
OU(s): N/A	**Issue Category: Remedy Performance**			
	Issue: SVE mass removal is not as expected in the ROD.			
	Recommendation: The perched aquifer remediation timeframe, the effectiveness of SVE mass removal, and the percent reduction performance criteria should be evaluated.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	November 2016

Sitewide Protectiveness Statement (if applicable)	
Protectiveness Determination: Short-term Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy at Del Monte Corporation (Oahu Plantation) Superfund Site currently protects human health and the environment because there is no complete exposure route to untreated perched or basal aquifer groundwater and there are institutional controls included in the deed restrictions to prevent exposure until the groundwater meets the MCLs. However, in order for the remedy to be protective in the long-term, an evaluation of the impact of background concentrations on current RAOs should be performed, the perched aquifer and SVE performance criteria should be evaluated in the context of future vapor intrusion from the vadose zone, and the cleanup levels of 1,2,3-TCP and DBCP should be re-evaluated.	

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List of Abbreviations

1,2-DCP	1,2-dichloropropane
1,2,3-TCP	1,2,3-trichloropropane
AOC	Administrative Order of Consent
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BMW	Basal Monitoring Well (for numbered wells)
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Constituent of Concern
DBCP	1,2-dibromo-3-chloropropane
DLNR	Hawaii Department of Land and Natural Resources
EDB	ethylene dibromide
EPA	Environmental Protection Agency
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FYR	Five-Year Review
GAC	granular activated carbon
gpm	gallons per minute
HAP	hazardous air pollutant
HAR	Hawaii Administrative Rules
HCC	Hawaii Country Club
HDOH	Hawaii Department of Health
IC	institutional control
IRIS	Integrated Risk Information System
JCC	James Campbell Company, LLC
kg	kilogram(s)
KVA	Kunia Village Area
KVSA	Kunia Village Source Area
KWTS	Kunia Well Treatment System
MCL	maximum contaminant level
µg/L	micrograms per liter
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NPL	National Priority List
O&M	operation and maintenance
OU	Operable Unit
PA/SI	Preliminary Assessment/Site Investigation
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
RfCi	Inhalation Reference Concentration
RfDo	Oral Reference Dose
ROD	Record of Decision
RSL	Regional Screening Level

Site	Del Monte Corporation (Oahu Plantation) Superfund Site
SVE	soil vapor extraction
TCLP	toxicity characteristic leaching procedure
U.S.C.	United States Code
VISL	Vapor Intrusion Screening Level
VOC	volatile organic compound

Second Five-Year Review Report for Del Monte Corporation (Oahu Plantation) Superfund Site, Honolulu, Hawaii

Introduction

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of FYRs are documented in five-year review reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.

EPA conducted the FYR and prepared this report regarding the remedy implemented at the Del Monte Corporation (Oahu Plantation) Site (Site) in Kunia, Honolulu, Hawaii. EPA is the lead agency for developing and implementing the remedy for the Site.

This is the second FYR for the Site. The triggering action for this review is the previous FYR. The FYR is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

The Site selected remedy is divided into two parts: 1) the shallow groundwater (perched aquifer) and contaminated soil in the Kunia Village Area from approximately 20 feet below ground surface (bgs) to 100 feet bgs and 2) the deep groundwater (basal aquifer). (Note that in this report each part of the overall Site remedy is sometimes also called a "remedy."). The remedy for the perched aquifer includes an extraction and treatment phytoremediation system, a vegetated soil cap, a soil vapor extraction system, and land use restrictions. The remedy for the basal aquifer includes monitoring wells and an extraction and treatment system.

Site Chronology

The following table lists the dates of important events for the Del Monte Corporation (Oahu Plantation) Superfund Site (Site).

Table 0-1: Chronology of Site Events

Event	Date
Del Monte Corporation (Del Monte) raised pineapples on 6,000 acres in central Oahu. Fumigants (pesticides) were stored, mixed, and used to control nematodes (worms) that infest pineapples.	1940s – 2006
The Kunia Well produced domestic and agricultural water for about 700 residents of Kunia village.	1946 – April 25, 1980
An accidental spill of about 495 gallons of the soil fumigant ethylene dibromide (EDB), containing about 0.25 percent 1,2-dibromo-3-chloropropane (DBCP), occurred on bare ground about 60 feet away from the Kunia Well.	April 7, 1977
The Hawaii Department of Health (HDOH) sampled the Kunia Well for EDB to see if the well had been contaminated. Analytical results were nondetect for EDB.	April 15, 1977
DBCP was detected in drinking water wells near fumigated farmland, so HDOH again sampled the Kunia Well, and found EDB and DBCP.	April, 24 1980
Due to confirmed EDB and DBCP contamination, Del Monte disconnected the Kunia Well from the Kunia Village drinking water distribution system.	April 25, 1980

Event	Date
Del Monte initiated soil and groundwater investigations and remedial cleanup efforts in the vicinity of the Kunia Well. Besides the Kunia Well spill site, significant soil and groundwater contamination was identified at the Former Soil Fumigant Mixing and Former Soil Fumigant Storage Areas located about 50 – 150 ft northwest of the Kunia Well. With HDOH approval, approximately 18,000 tons of contaminated soil from the spill site was excavated, spread, and aerated on inactive Del Monte pineapple fields.	1981 – 1983
Shallow groundwater extraction wells were installed and operated in the upper (perched) groundwater aquifer to extract contaminated perched groundwater and reduce infiltration to the deeper (basal) aquifer. The Kunia Well was pumped approximately twice a week for 4 to 8 hours per day, to limit potential downgradient migration of chemicals in the basal aquifer. The extracted water from these wells was used to control road dust and irrigate noncrop areas.	1980 – 1994
Del Monte funded epidemiologic studies, conducted by the University of Hawaii, which indicated no acute effects in the exposed population due to short-term exposures from Kunia Well water.	1981
A Preliminary Assessment/Site Inspection (PA/SI) and hazard ranking scoring process was conducted by EPA.	1990
The Site was proposed for listing on the National Priorities List (NPL).	May 10, 1993
EPA signed a memorandum of action with the State of Hawaii, whereby EPA agreed to assume the role of lead agency with respect to enforcement activities at the Site.	November 25, 1994
In 1994, EPA requested that land spreading of the contaminated water stop as it may violate the Resource, Conservation, and Recovery Act (RCRA).	1994
The Site was placed on the final NPL.	December 16, 1994
The Agency for Toxic Substances and Disease Registry (ATSDR) evaluated health effects from the pre-1980 domestic use of Kunia Well water, and the effects of contaminated water use for dust control and noncrop irrigation. The ATSDR concluded that Kunia Village residents had not been exposed to significant levels of EDB and DBCP.	February 7, 1995
An Administrative Order of Consent (AOC) was signed by Del Monte, the State of Hawaii, and EPA requiring completion of the Remedial Investigation and Feasibility Study (RI/FS).	September 25, 1995
Del Monte conducted a Superfund Treatability Study of phytoremediation using vegetation (koa haole plants) to treat contaminated groundwater. Closed-loop phytoremediation treatment cells were constructed and are being successfully used to treat extracted groundwater.	1998 – Present

Event	Date
The RI was conducted during 1997 and 1998 and the Final RI report was approved by EPA.	February 4, 1999
A baseline risk assessment (BRA) was performed to evaluate potential risks to human health for current Kunia Village residents and maintenance workers, downgradient Hawaii Country Club (HCC) workers, and downgradient hypothetical future residents.	December 14, 2000
The final Feasibility Study, evaluating various remedial alternatives, was completed and approved by EPA.	April 22, 2003
The Record of Decision (ROD) was issued by EPA.	September 25, 2003
The First Amendment to the 1995 AOC was signed requiring Del Monte to install three deep basal aquifer monitoring wells and begin extracting and treating groundwater from the Kunia Well. The AOC also specified that additional basal aquifer monitoring wells would be installed as part of Remedial Design/Remedial Action (RD/RA).	January 12, 2004
EPA deleted the Poamoho section of the Site from the NPL, because they had determined, with concurrence from the HDOH, that the Site location presents no significant threat to human health or the environment.	January 13, 2004
The design for the Kunia Well Treatment System (KWTS) was completed and approved by EPA.	May 10, 2004
Quarterly basal groundwater monitoring and reporting is conducted.	2004 – Present
Consent Decree signed between EPA and Del Monte requiring Del Monte to complete remaining RD/RA work, as specified in the ROD.	September 27, 2005
EPA issued a letter to Del Monte directing that an investigation be undertaken to develop background concentrations of EDB and DBCP in the basal aquifer, and indicating that a Technical Impracticability waiver for cleanup to Hawaii maximum contaminant levels (MCLs) may be appropriate for the Site.	February 2, 2006
EPA conducted an inspection of the KWTS and determined it was operational and functional as specified in the ROD.	May 17, 2006
EPA notified the landowner of the Oahu Plantation, James Campbell Company, LLC (JCC), that they are considered potentially responsible for costs incurred in implementing the institutional controls (IC) portion of the remedial action.	August 31, 2005
Del Monte announces they will cease production, harvesting, and shipment of pineapples at the Site.	November 2006
A Consent Decree was signed by the Department of Justice, EPA, and JCC, and lodged in U.S. District Court, requiring JCC to implement ICs.	June 8, 2007

Event	Date
Final remedial action documents were completed including the Remedial Action Work Plan, Operations and Maintenance Manuals for the KWTS and Perched Aquifer System, Compliance Monitoring Plan, Evaluation of Background Concentrations of Chemicals of Concern, and a Three-Year Cumulative Basal Groundwater Monitoring Report.	2008 - 2009
The perched aquifer remediation system, vegetated cover, and additional monitoring and extraction wells were designed, constructed, and underwent startup and shakedown operations.	2006 to 2008
EPA conducted an inspection of the perched aquifer remedy and determined it was operational and functional as specified in the ROD, and the system became fully operational.	August 2008
A Preliminary Close Out Report documenting that all construction activities are complete at the Site was signed by EPA.	September 8, 2008
Quarterly Perched Aquifer Remediation System monitoring and reporting are conducted.	October 2008 - Present
The Del Monte lease with JCC expires and all plantation workers were laid off.	December 2008
Del Monte maintains responsibility for site cleanup and contractors will operate the remediation systems until cleanup goals are achieved.	December 2008 - Present
The property owner, JCC, sells all parcels of the former Site but will complete annual inspections of the parcels and well restriction area to determine that the ICs are kept in force, as required by the 2007 Consent Decree.	2008 – present
First Five-Year Review Completed	June 2010
Installation of the new background basal groundwater monitoring well (BMW-7) completed.	November 2012
Background wells (BMW-6 and BMW-7 were sampled bi-monthly to obtain a larger background data set for statistical analysis	Jan. 2013 – April 2014
Del Monte Proposes Trial Shutdown of the Kunia Well Basal Groundwater Extraction and Treatment System.	October 16, 2014

Background

1.1. Physical Characteristics

Del Monte's Oahu Plantation was formerly a 6,000-acre pineapple plantation located on the north-central plateau of the Island of Oahu in the State of Hawaii. Oahu's central plateau is bounded on the east by the Koolau Mountain Range and on the west by the Waianae Mountain Range (Figure 0-1).

The facility is approximately 15 miles from the City of Honolulu, and the closest town is Wahiawa, approximately 2 miles away. Schofield Army Barracks and Wheeler Military Airfield are located in close proximity to the plantation. The Oahu Plantation initially included two sections on either side of the Schofield Barracks (Figure 0-2).

- The Kunia Section, centered around Kunia Village, is located south of the barracks, and includes most of the areas investigated during the Remedial Investigation (RI). The land in the Kunia section gently slopes to the east and southeast from a maximum elevation of about 1,200 feet to about 750 feet above mean sea level. The parcel is bounded by Waikele Stream Gulch to the north and by the Schofield Barracks and Honouliuli Forest Preserve to the west. State Highway 750 (Kunia Road) crosses through this parcel of land.
- The Poamoho Section, adjacent to Poamoho Village, is located 3 miles north of the known source areas near the Kunia Well, and is located north of the Schofield Barracks. The Poamoho section was deleted from the NPL in January 2004 because the site presented no significant threat to human health or the environment.

The known source areas (Figure 0-3) are all located within the Kunia Village Area (KVA) of the Kunia Section. The KVA contains the Kunia Well Spill Area, the Former Soil Fumigant Storage Area, and the Former Soil Fumigant Mixing Area. The Spill Area and Kunia Well are situated atop relatively level ground at a surface elevation of about 850 feet above mean sea level. Because of earlier soil excavation activities, the Spill Area slopes gently to the north before dropping steeply approximately 30 feet to the Former Soil Fumigant Mixing Area. A fence was constructed around the excavation area and the Former Soil Fumigant Storage Area to restrict access. An ephemeral watercourse (gulch), which drains upland areas including pineapple fields to the west, runs outside of the northern side of the fenced area and discharges through a culvert running underneath Kunia Road into previous pineapple fields and eventually to Poliwai Gulch and Waikele Stream. The distance from the fenced area to Waikele Stream is approximately 1.5 miles, and the distance from the confluence of Poliwai Gulch and Waikele Stream to Pearl Harbor is approximately 3.5 miles.

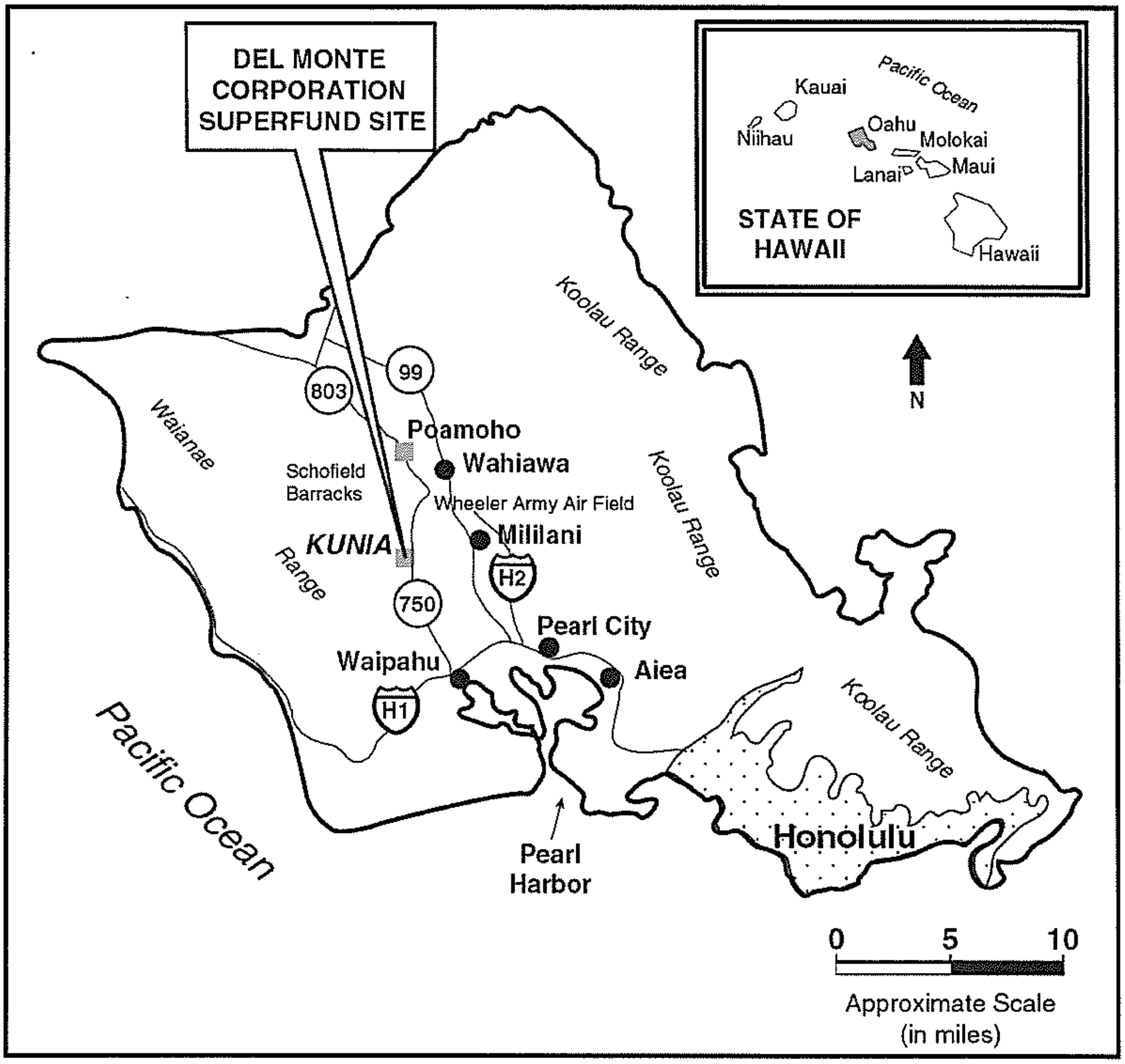


Figure 0-1: Location Map for the Site.

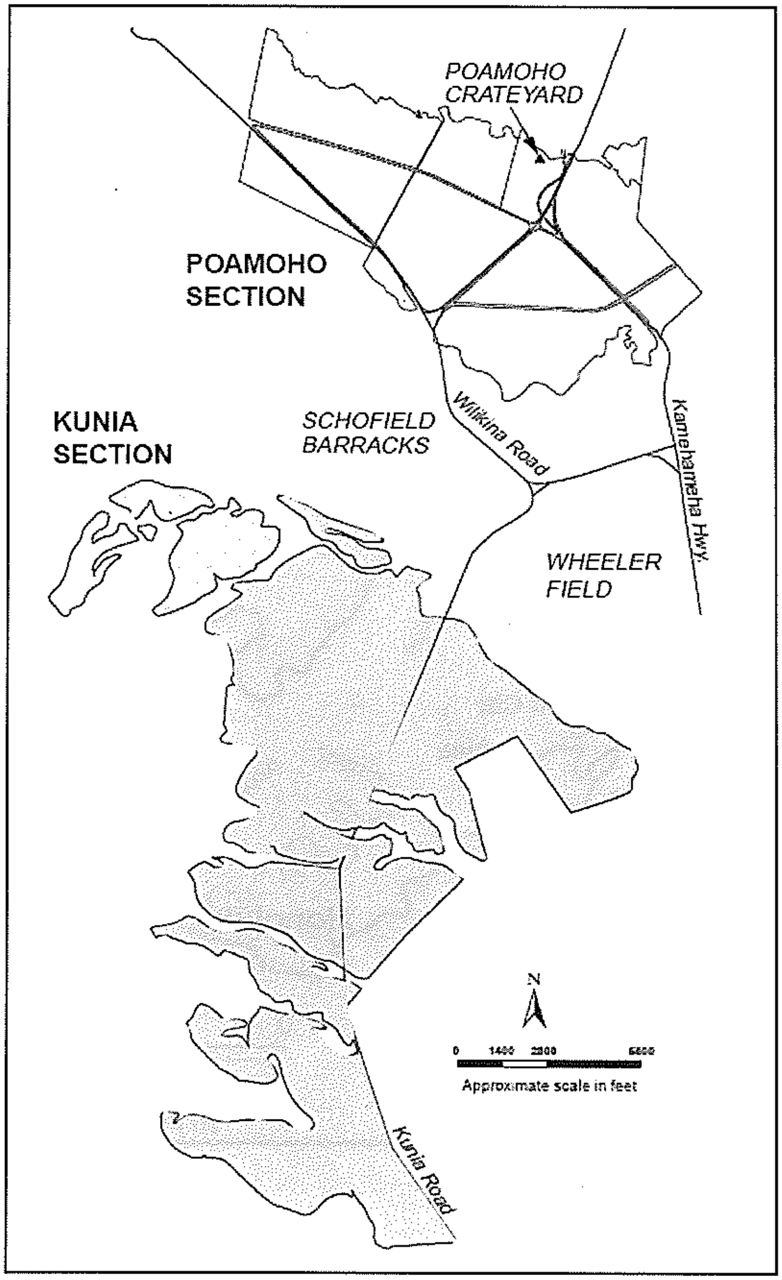


Figure 0-2: Poamoho and Kunia Sections of the Site.

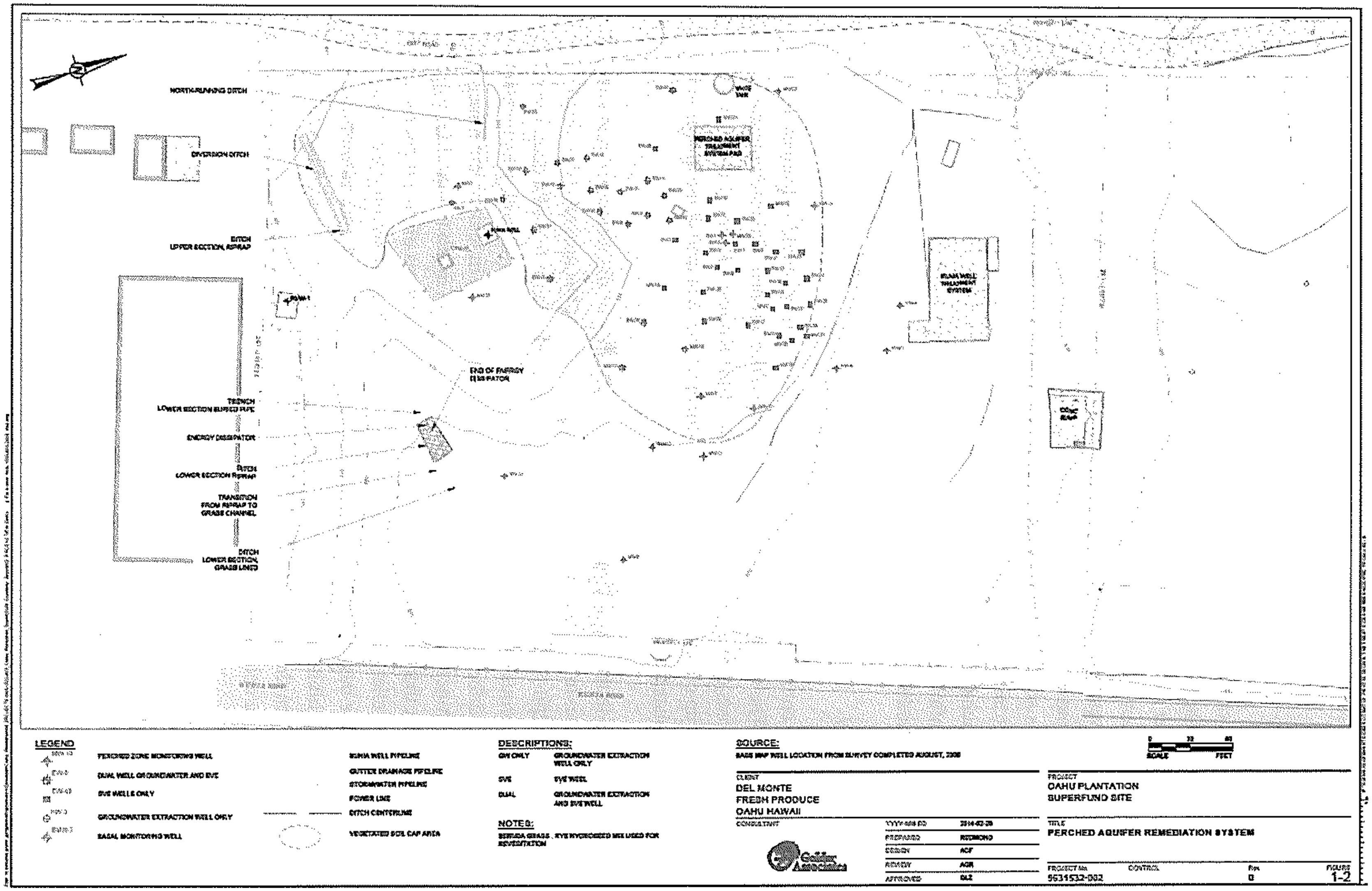


Figure 0-3: Kunia Well Source Area, Perched Aquifer Remediation System, (Golder, 2014).

1.2. *Hydrology*

1.2.1. Climate

The Island of Oahu is characterized by moderate temperatures that remain relatively constant throughout the year. The prevailing wind direction is east-northeast, the direction of the trade winds, which results in greater amounts of rainfall on the windward Koolau Range (eastern) than the leeward Waianae Range (western). Annual average rainfall on Oahu ranges from as little as 20 inches on the extreme leeward (or western) coast to as much as 300 inches at the crest of the Koolau Range in the east. Based on data from a rain gauge located at the Kunia Well site, average rainfall for the Kunia Village Area (KVA) is about 36 inches per year, with October through March the wettest months at about 4 to 5 inches per month and April through September the driest at about 1 to 2 inches per month. The occurrence of groundwater resources on Oahu is the direct result of rainfall infiltration. Due to the higher amounts of rainfall in the Koolau Range as compared to the Waianae Range, most of the recharge to basal groundwater is associated with the Koolau Range.

1.2.2. Geology

The Island of Oahu is comprised of the remnants of two late Tertiary shield volcanoes and their associated rift zones. The western part of the island is the older, eroded Waianae volcano; the eastern part of the island consists of the younger, eroded dome of the Koolau volcano. Lava flows from the Koolau volcano piled up on top of the older, eroded slopes of the Waianae dome and produced the broad gently sloping plateau in the central area of Oahu.

Near surface materials in the vicinity of the Site consist primarily of the weathered remnants of the original basaltic surface. In situ decomposition of basaltic bedrock has progressed to depths of approximately 100 to 200 feet bgs. Near surface soils consist of several feet of a deep-red soil having a loose, and generally porous structure. Underlying the surface soil is the subsoil, which extends to depths of about 10 to 30 feet. The subsoil is similar to the surface soil in texture and mineralogy, but has larger and more distinct structural units. The subsoil grades with depth to saprolite, which is a highly weathered basalt that retains some textural and structural features of the parent rock, such as vesicles, fractures and relict minerals. Saprolite is a clay-rich thoroughly decomposed rock formed by in-situ weathering of the basalt. Beneath the saprolite lies basalt. In places, the basalt immediately beneath the saprolite exhibits some moderate weathering. This zone of weathered basalt is a transitional zone between the highly weathered saprolite and fresh basalt. See Figure 0-4 for a generalized stratigraphic column of the site.

As basalt weathers to saprolite, its pore structure is altered and, generally, permeability is decreased as secondary clay minerals fill in pore spaces. In the KVA, the permeability is low enough to create locally perched water tables (the perched aquifer) within the saprolite zone. The saprolite generally has a thickness of about 50 to 150 feet.

1.2.3. Hydrogeology

Groundwater occurs within two distinct zones in the KVA: the perched (shallow) aquifer and the basal (deep) aquifer. The perched aquifer is a localized aquifer that exists in the vicinity of the Kunia Well. Perched groundwater is not used for any purpose, but water from the perched aquifer infiltrates down to the basal aquifer. The perched aquifer extends to approximately 100 feet bgs and is confined to the saprolite material above the weathered basalt. The saprolite has relatively low permeability, with horizontal hydraulic conductivity on the order of 0.01 to 1 feet/day and vertical hydraulic conductivity about one order of magnitude less. Groundwater flow is primarily vertically downwards, and horizontal flow in the perched aquifer occurs north-northeast.

Basal groundwater is used for drinking water and irrigation; generally it flows in a southerly direction. The basal groundwater begins at approximately 850 feet bgs. The Waianae and Koolau lava flows are the sources of the two basal aquifers present in the Kunia area. The saturated basalt is highly permeable with a groundwater gradient of about 1 to 1.5 feet/mile. Hydraulic conductivity is about 2,000 feet/day. Most flow structures in the basalt (lave tubes, clinker layers, contraction joints) are parallel to horizontal flow, so the rock is more conductive horizontally than vertically.

The KVA is located above the Pearl Harbor Basal Water Body which is divided into two aquifer systems: the Ewa-Kunia aquifer system (or Waianae aquifer) and the Waiawa-Waipahu aquifer system (or Koolau aquifer). The Aquifer Systems for Oahu are shown in Figure 0-5. The blue area is the Pearl Harbor Basal Water Body, and the two shades of blue differentiate the two aquifer systems.

The original site conceptual hydrogeologic model assumed the Kunia Well and BMW-1 were located in the Ewa-Kunia aquifer system (Golder, 2014). Data from the installation of the additional monitoring wells indicate that most of the basal monitoring wells were actually located in the Waiawa-Waipahu aquifer system. The surface contact between the Waianae and Koolau basalts is located 4,000 feet to the west of the Kunia Well. The dip of the Waianae basalts is 19° to the east, so the estimated location of the contact between the Koolau and Waianae basalts at the basal aquifer water table elevation is about 1,000 to 2,000 feet west of the Kunia Well (Figure 0-6). The contact is comprised of a weathered zone and accumulations of alluvium separating the lower, older Waianae lavas from the younger Koolau lavas. Hydraulic head drop across the contact is about 2 to 3 feet, with heads in the Koolau basalts being higher. Therefore, flow across the contact is always from the Waiawa-Waipahu to the Ewa-Kunia, and the Waiawa-Waipahu aquifer system is a major source of recharge to the Ewa-Kunia aquifer system. To date, no constituents of concern (COCs) have been detected in basal monitoring or production wells completed in the Ewa-Kunia aquifer system.

As a result of historical, uncontrolled releases of fumigants in the vicinity of the Kunia Well, both soil and perched groundwater in this area contain high levels of fumigants. The basal aquifer contains lower levels of contaminants; however, the concentrations are above Hawaii maximum contaminant levels (MCLs).

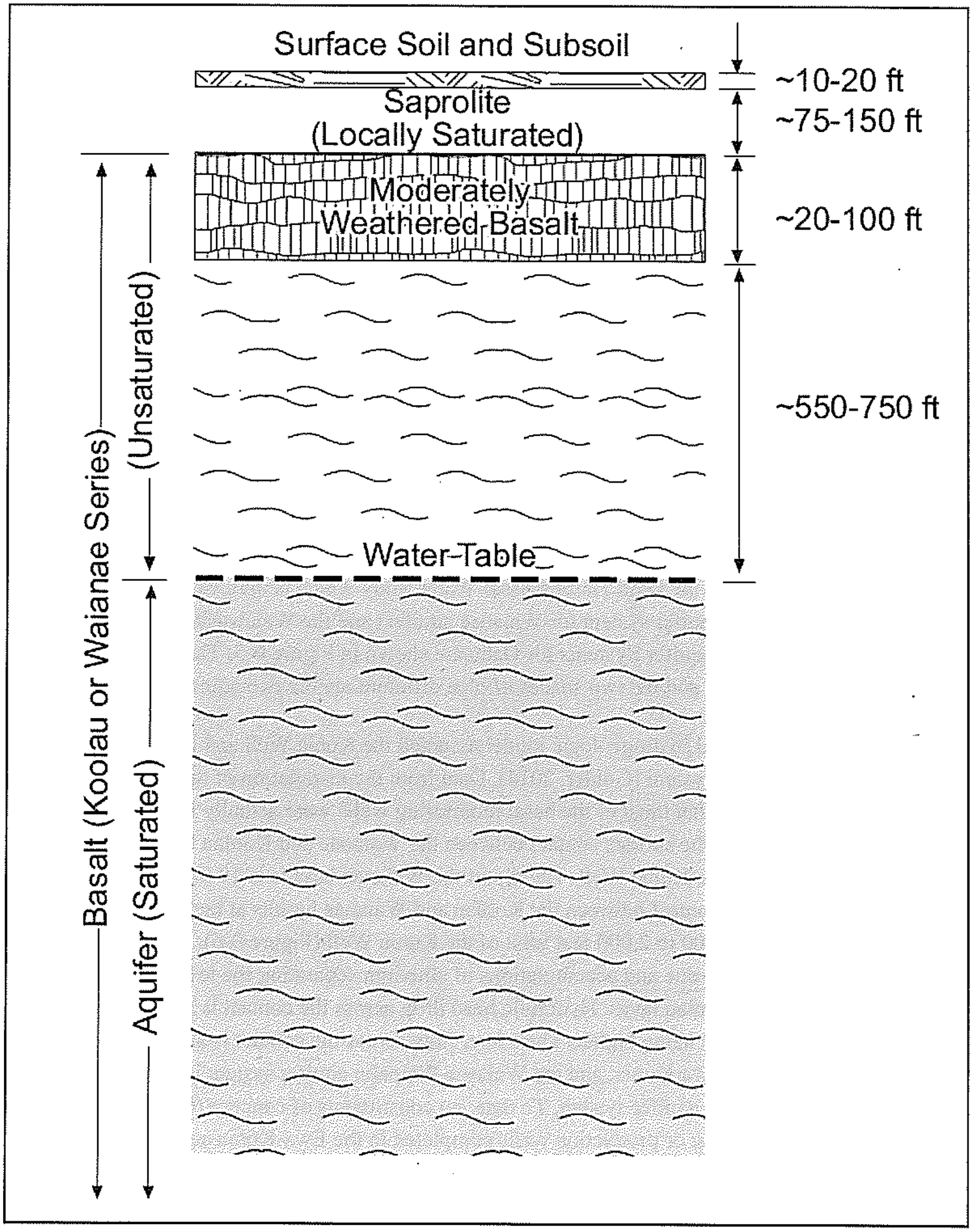


Figure 0-4: Generalized Stratigraphic Column at the Site from the Del Monte ROD (EPA, 2003).

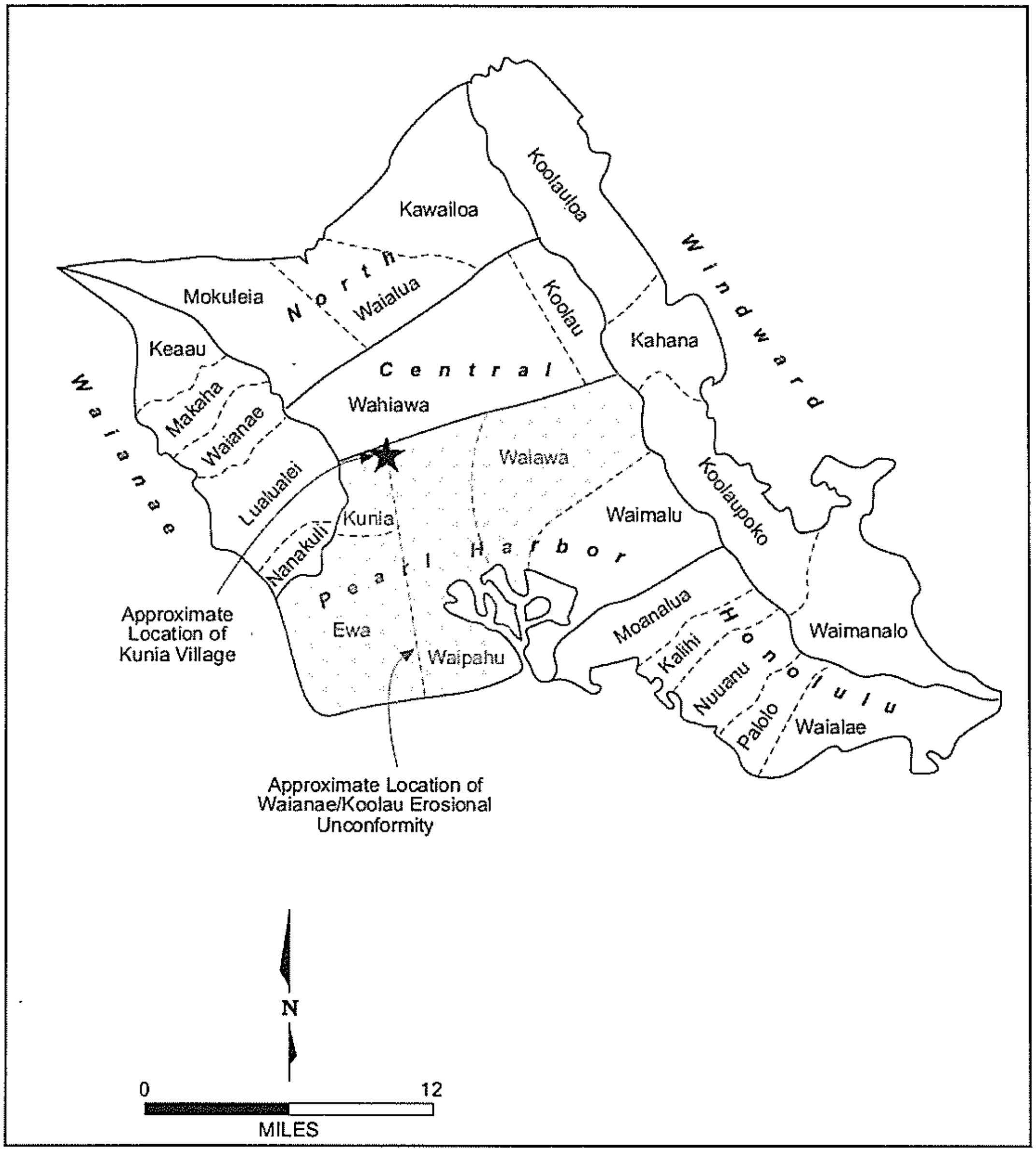


Figure 0-5: Layout of Aquifer Sectors and Systems for Oahu (Golder, 2014).

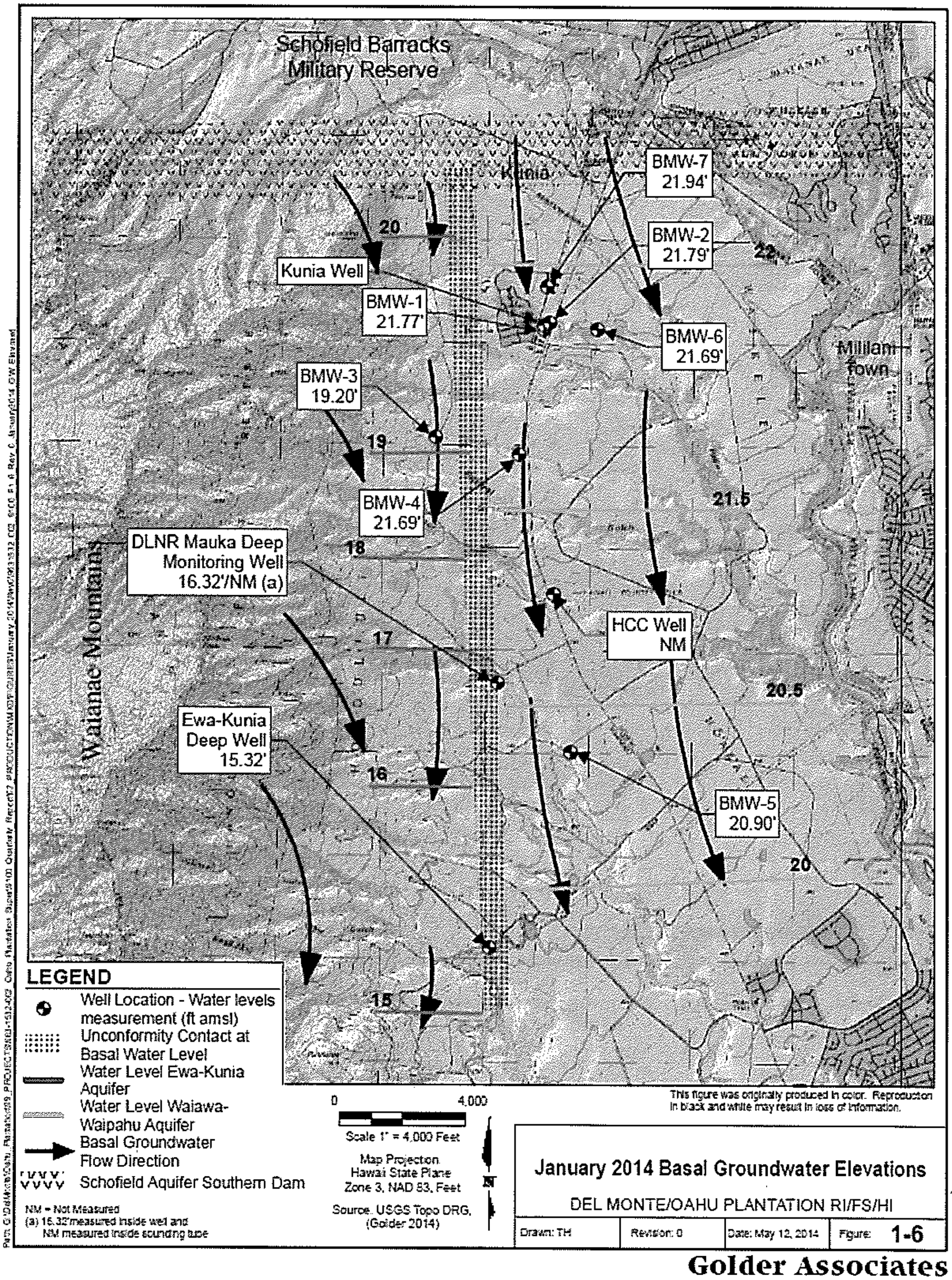


Figure 0-6: Basal Aquifer Flow Map (Golder, 2014).

1.3. Land and Resource Use

1.3.1. Land Uses

Del Monte grew and processed pineapple on the Oahu Plantation from about 1946 to November 2006. Del Monte leased the land from the owner, JCC, until the lease expired in December 2008. While comprised primarily of agricultural areas, the plantation also contained two company-operated housing areas (Kunia Village and Poamoho Village), equipment maintenance areas, chemical storage areas, warehouses, administrative buildings, and a fresh pineapple packing facility. The Kunia Village housing complex is in close proximity to the primary source areas located around the Kunia Well and the surrounding historical chemical storage, mixing, and handling areas.

The plantation property was sold by JCC for use by other agricultural operations and military housing. A Consent Decree (EPA, 2007) requires JCC to implement institutional controls (ICs) to ensure that the new owners do not engage in activities that may interfere with the operation of the remedial systems and to ensure that annual inspections of the parcels and well restriction area are completed to document that the ICs are being maintained. ICs also prevent unauthorized installation of production wells in the well restriction area.

1.3.2. Groundwater Uses

The shallow, perched groundwater is not a current or potential future source of drinking water because it does not provide sufficient sustainable yield for use as a water supply. Therefore, no drinking water or irrigation production wells pump from the shallow, perched groundwater aquifer.

There are production wells in the deeper basal aquifer in both the KVA and in downgradient areas. The Kunia Village Well was formerly used for drinking water purposes, but was disconnected from the potable water supply system in April 1980 after contamination was discovered in the well. Between 1980 and 1994, the well was pumped periodically with the water discharged directly to noncrop fields.

The drinking water for the KVA is presently supplied primarily by the "Navy Well" and occasionally, since 1991, by Del Monte Well No. 4. Both the "Navy Well" and Del Monte Well No. 4 are located approximately 1.5 miles north (upgradient) of Kunia Village. These two drinking water supply wells have been approved by the Hawaii Department of Health (HDOH). In addition to being used for drinking water purposes, basal groundwater extracted and treated was used for irrigation of pineapple crops on the Site.

1.4. History of Contamination

Del Monte grew and processed pineapple on the plantation from about 1946 to November 2006. During that time, a number of pesticides (soil fumigants) were applied to the soil to control nematodes (worms) that attack pineapple roots. These fumigants were stored, mixed, and spilled in an area near the Kunia Well, a former drinking water supply well. Fumigants spilled in the area have contaminated shallow (20 to 100 feet bgs) subsurface soil and perched groundwater, as well as deep basal groundwater. Constituents of concern (COCs) in soil and groundwater are ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP), 1,2-dichloropropane (1,2-DCP), and 1,2,3-trichloropropane (1,2,3-TCP).

In April 1977, an accidental spill involving about 495 gallons of the soil fumigant EDB containing 0.25 percent DBCP occurred on bare ground within approximately 60 feet of the Kunia Well. The spill resulted from the failure of a hose connector on a bulk transport container during transfer operations to an above ground storage tank. EDB contamination was not detected above the detection limit of 0.5 milligrams per liter in the Kunia Well based on analytical results of samples taken by the HDOH within one week of the spill. However, subsequent sampling conducted in April 1980 indicated the presence of EDB and DBCP which resulted in disconnection of the Kunia Well from the Kunia Village drinking water system.

In response to the detection of the compounds in the Kunia Well, Del Monte initiated soils and groundwater investigations to determine the extent of contamination in the spill area and adjacent areas where pesticides had been stored and mixed. In addition to the Kunia Well spill area, other areas impacted with fumigants near the well were identified, including the Former Soil Fumigant Mixing Area and Former Soil Fumigant Storage Area (Figure 0-7). These areas are located within about 50 to 150 feet northwest of the Kunia Well. The nature of accidental spillage near the former mixing and storage areas may have been intermittent over a span of years, and the cumulative quantity of accidental spillage in these areas is unknown.

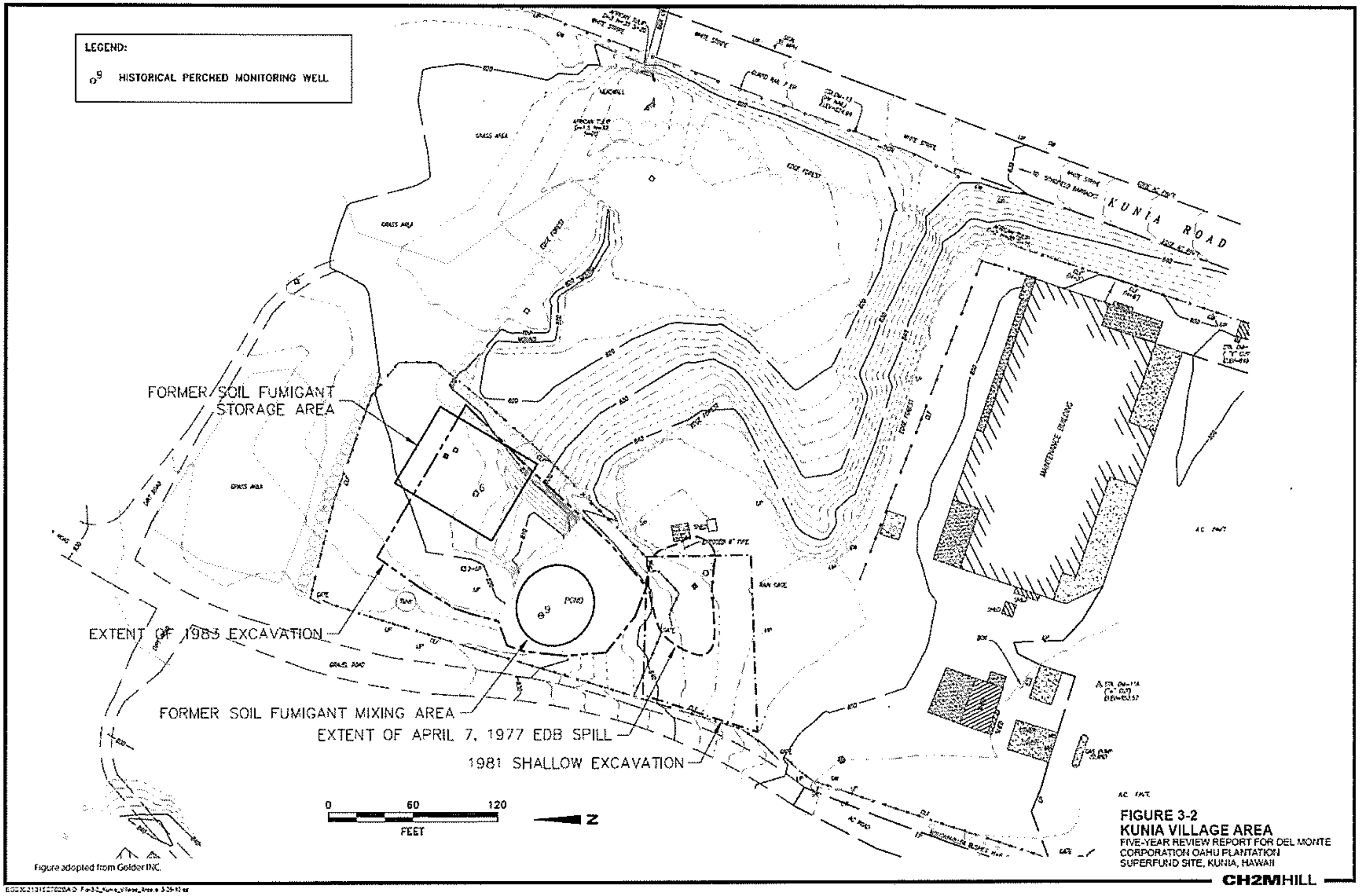


Figure 0-7: Kunia Village Area with Initial Contamination Areas.

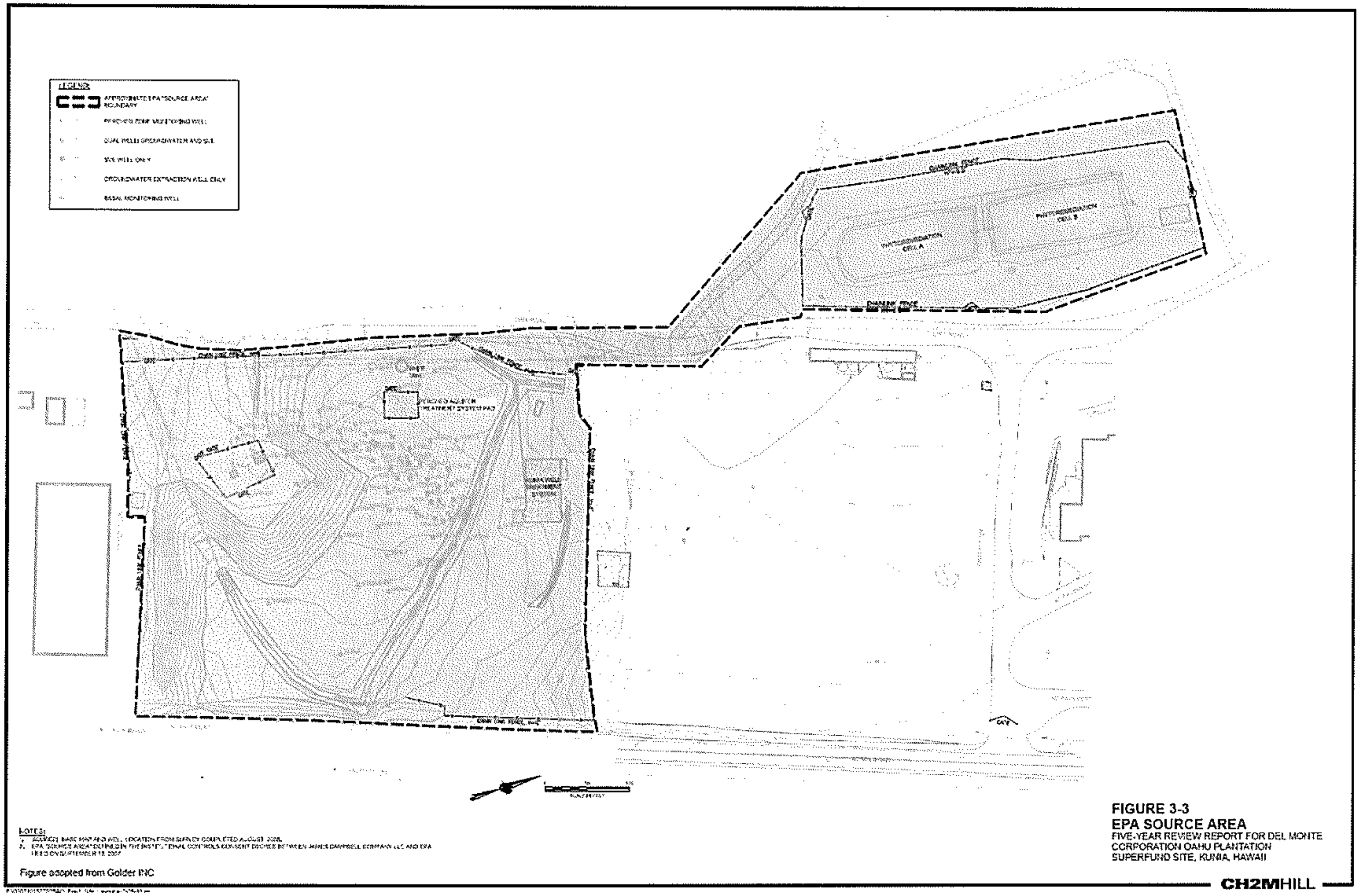


Figure 0-8: Perched Aquifer Treatment System and Phytoremediation Locations.

1.5. Initial Response

Based on the initial investigations, 2,000 tons of contaminated soil were removed from the EDB spill area in 1981, and 16,000 tons of contaminated soil were removed from the former pesticide mixing and storage areas in 1983 (Figure 0-7). These soil removal activities resulted in the creation of a 60-foot-deep by 75-foot-wide by 75-foot-long excavation pit. With HDOH approval, the excavated soil was spread on a nearby field ("Field 8") to facilitate volatilization of COCs. Field 8 was sampled during the Remedial Investigation and analyses indicated no detectable levels of COCs. Immediately after the completion of excavation activities, a fence was constructed around the excavation area and the Former Soil Fumigant Storage Area to restrict access. The entire fenced area around the pit drained generally towards the excavation, which collected water during periods of heavy rainfall (EPA, 2003). With EPA's approval, the pit was backfilled in October 1999.

In addition, three groundwater extraction wells were installed into the shallow, perched aquifer and pumped periodically from 1980 to 1994. The Kunia Well was also pumped periodically during this time period. The extracted perched groundwater was used for dust control on in-field pineapple roads away from residential populations. Groundwater pumped from the Kunia Well was used for noncrop irrigation of a grass-covered field approximately 350 feet north of the Kunia Well site. In September 1994, EPA requested Del Monte cease pumping of the Kunia Well and perched groundwater wells due to concerns regarding use of the extracted water.

A Preliminary Assessment/Site Investigation (PA/SI) was conducted by EPA at the site in 1990. During 1994, the Agency for Toxic Substances and Disease Registry (ATSDR) conducted a public health assessment and concluded that residents of Kunia Village had not been exposed to significant levels of EDB and DBCP in their drinking water. The Oahu Plantation was classified as a "No Apparent Public Health Hazard" for past and current conditions. ATSDR also concluded that the site may pose an "Indeterminate Health Risk," for future exposures because of the need to characterize potential impacts on downgradient wells. The site was added to the National Priorities List (NPL) on December 16, 1994. Del Monte Fresh Produce (Hawaii) Inc., EPA, and the State of Hawaii signed an administrative order of consent (AOC) for a Remedial Investigation/Feasibility Study (RI/FS) and Engineering Evaluation and Cost Analysis on September 28, 1995.

In 1998, Del Monte entered into an agreement with the U.S. Department of Agriculture, U.S. Army, and U.S. Army Corps of Engineers to conduct a Superfund Treatability Study of phytoremediation using vegetation (koa haole plants) to treat contaminated groundwater. Closed-loop phytoremediation treatment cells were constructed and successfully used to treat extracted perched groundwater.
The phytoremediation cells are shown in Figure 0-8.

The Del Monte Corporation Superfund Site Remedial Investigation (RI) was conducted in 1997 and 1998 and the final RI report (Golder Associates, Remedial Investigation Report for the Del Monte Corporation (Oahu Plantation) Super Fund Site, November 1998) was approved by EPA on February 4, 1999. With EPA's approval, the pit was backfilled in October 1999 (EPA, 2003). The final Feasibility Study was approved on April 22, 2003. The first amendment to the AOC for the Remedial Investigation/Feasibility

Study was signed on January 12, 2004. Prior to entry into the Consent Decree, EPA approved the Basal Groundwater Monitoring Plan and the Design Report for the Kunia Well pump-and-treat system for the basal aquifer and the soil vapor extraction pilot test work plan for the perched aquifer.

1.6. Basis for Taking Action

The primary constituents of concern (COCs) for the Del Monte Corporation (Oahu Plantation) (Site) in soil and groundwater are EDB, DBCP, 1,2-DCP, and 1,2,3-TCP. Based on data from various animal studies and other scientific evaluations, all four COCs found in the basal groundwater aquifer (EDB, DBCP, 1,2-DCP, and 1, 2, 3-TCP) are classified as probable human carcinogens for an oral route of exposure. EDB and DBCP are also classified as probable human carcinogens for the inhalation route.

Risk characterization results demonstrate potentially unacceptable cancer and noncancer risks to Kunia Village and downgradient residents within 1.5 miles of the Kunia Village Area. The presence of COCs in excess of State of Hawaii drinking water MCLs in the basal aquifer, and the use of groundwater in the Site vicinity as a source of irrigation and drinking water provided the basis for taking action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Remedial Actions

1.7. *Remedy Selection*

The ROD for the Site was signed in September 2003. The main goals of the selected remedial actions at the Site were to eliminate exposure to contaminants at the Site and to restore the groundwater underneath the Site to drinking water use. Specifically, the remedial action objectives (RAOs) for the Site are to:

- Prevent exposure of the public to contaminated groundwater above chemical-specific cleanup levels (described below in Table 0-1);
- Inhibit further migration of the contaminant plume away from the Kunia Village Source Area (KVSA) (source control);
- Limit discharge of KVSA perched groundwater and deep soil contaminants to basal groundwater such that basal groundwater concentrations do not exceed the chemical-specific cleanup goals described below (source control), and;
- Restore basal groundwater to its beneficial use of drinking water supply within a reasonable timeframe (aquifer restoration).

EPA's selected cleanup remedy is divided into two parts: 1) the shallow groundwater (perched aquifer) and contaminated soil in the KVSA from approximately 20 feet bgs to 100 feet bgs, and 2) the deep groundwater (basal aquifer). The selected two-part remedy addresses contamination through the actions described below.

1.7.1. Perched Aquifer and Deep Soil Remedy Components

The contaminated soil in the KVSA has been designated as a principal threat at the Site. EPA's goal is to prevent perched aquifer and deep soil contaminants (deeper than 20 feet) from further contaminating the basal aquifer. This will be achieved by extracting and treating contaminated groundwater from the perched aquifer and treating deep soil. Specific components include:

- Pumping contaminated groundwater from the perched aquifer and treating the water using vegetation (plants), referred to as phytoremediation).
- Placing a vegetated soil covering (a cap) over the contaminated soil area (the source area). The soil cap will reduce the amount of rainwater that moves through the soil and carries contaminants down to the basal aquifer.
- Installing a soil vapor extraction (SVE) system to withdraw contaminants present in vapor form (volatile chemicals) from the soil. The extracted vapor will be treated with a carbon filter to remove the contaminants before the vapor is released to the atmosphere.
- Restricting land use (Institutional Controls [ICs]) to prevent exposure to contaminated soil and perched groundwater impacted by constituents of concern (COCs) and to prevent activities that might interfere with the effectiveness of the remedy.

1.7.2. Basal Aquifer Remedy Components

EPA's goal is to prevent future exposure to contaminated groundwater in the basal aquifer. The selected remedy components in addressing the basal aquifer are as follows:

- Installing monitoring wells to characterize the extent of contaminated groundwater in both the source area and the downgradient plume.
- Extracting and treating contaminated groundwater in a phased manner, starting at the Kunia Well.
- Monitoring the effectiveness of source control and evaluating whether natural attenuation is effective at reducing contaminant concentrations in the downgradient plume to drinking water standards.
- If monitoring data indicate no evidence of natural breakdown, install additional extraction wells to ensure the entire plume is captured and treated.
- Treating the contaminated groundwater to drinking water standards using air stripping and carbon adsorption.
- Using treated groundwater for irrigation.
- Restricting land use (ICs) to prevent exposure to basal groundwater impacted by COCs and to prevent activities that might interfere with the effectiveness of the remedy.

To meet the RAOs, migration control will be required in the Kunia Village basal aquifer source area as long as contaminant concentrations in groundwater exceed cleanup levels and downgradient actions will be required until the entire area of contamination meets cleanup levels. The RAOs for the Site incorporate the chemical-specific cleanup levels in the basal aquifer shown in Table 0-1. As the table indicates, EPA has selected MCLs as the cleanup levels in the basal aquifer. MCLs (sometimes called drinking water standards) are regulatory limits that apply to drinking water served for consumption. EPA has selected State of Hawaii MCLs as the cleanup level for three of the COCs because they are lower than Federal MCLs.

Table 0-1: Cleanup Levels for COCs at the Site

Chemical of Concern	Federal MCL (µg/L)	Hawaii State MCL (µg/L)	ROD Cleanup Level (µg/L)
EDB	0.05	0.04	0.04
DBCP	0.2	0.04	0.04
1,2,3-TCP	—	0.6	0.6
1,2-DCP	5	5	5

1.8. Remedy Implementation

Groundwater monitoring, extraction, and treatment for the perched aquifer started in 1998 as part of the phytoremediation treatability study. In 2008, modifications were made to improve system performance and combine groundwater extraction with soil vapor extraction (SVE). The Kunia Well Treatment System (KWTS) was designed in 2003, constructed in 2005, and has been operating since September 2005.

1.8.1. Perched Aquifer and Deep Soil Remedy

The perched aquifer source area refers to the portion of the perched aquifer where COCs in groundwater exceed 1.0 micrograms per liter (µg/L). The Perched Aquifer and Deep Soil Remedy consists of a vegetative soil cap, as well as groundwater extraction and treatment and SVE systems for the perched aquifer source area.

Between 1998 and 2008, 24 monitoring wells were installed to delineate the extent of perched aquifer COCs, and 42 perched aquifer groundwater extraction wells were installed to reduce infiltration to the basal aquifer of perched groundwater containing the highest levels of COCs. Prior to completion of the full-scale perched groundwater extraction and SVE treatment system (completed in July 2008), extracted groundwater was treated in the phytoremediation system. Construction activities included the conversion of 30 monitoring and extraction wells that had little water present or that were dewatered from previous pumping to new SVE wells. Additionally, 19 wells were converted into dual extraction wells to serve as both SVE and groundwater extraction wells. By July 2008, 19 dual and two groundwater-only extraction wells were fitted with air-driven, low-level drawdown groundwater extraction pumps. These pumps are typically set approximately 1.5 feet from the bottoms of the wells to maximize the ability to dewater the perched aquifer for SVE operations. Pumps automatically activate when the water level rises above the pump and deactivate when the water is lowered to the top of the pump.

Extracted perched groundwater is currently treated by the KWTS (the primary treatment route), or by phytoremediation if the KWTS is not operating. The phytoremediation system is a closed-loop system with no subsurface infiltration or discharge. Lined phytoremediation cells collect excess water in a sump and then recirculate it through a drip irrigation system.

The perched aquifer remediation system is shown on Figure 0-3. There are currently 63 perched aquifer wells at the Site. Twelve wells are groundwater monitoring only; the remaining 51 wells consist of 19 dual groundwater extraction and SVE wells, 30 SVE only wells, and two groundwater-only extraction wells (Golder, 2014). Dual-extraction and SVE-only wells are plumbed into nine groups of wells called "headers," which are connected to two vacuum blowers that extract air from the subsurface soil, along with volatile organic compounds (VOCs), in the vicinity of the wells. The extracted air and VOCs are treated with granular activated carbon (GAC) before the off-gas is discharged to the atmosphere.

In 2008, a vegetative soil cover was installed over the entire perched aquifer source area to reduce infiltration to the perched aquifer. A storm water control system was also installed to divert runoff to drainage channels around the perched aquifer.

1.8.2. Basal Aquifer Remedy

The Basal Aquifer Remedy consists of the KWTS, designed to restore the basal aquifer in accordance with the ROD. The system consists of groundwater extraction from the Kunia Well, treatment of extracted groundwater, and distribution of treated water to a crop irrigation system (as detailed in Final O&M Manual for the Kunia Well Pump-and-Treat System, Del Monte Corporation (Oahu Plantation) Superfund Site, Golder, 2008). The KWTS is enclosed within a 6-foot-high chain link fence to prevent unauthorized entry to the treatment area. Groundwater is generally extracted 24 hours a day, except for weekends, holidays, and during routine maintenance, with a constant flow electric pump. Extracted groundwater from the Kunia Well is treated to below Hawaii MCLs for the COCs by air stripping, followed by liquid-phase carbon adsorption for effluent from the air stripping tower. Treated groundwater is pumped into a 10-inch-diameter discharge pipe that connects to the irrigation distribution piping in the Kunia section of the Site.

As specified in the ROD, Del Monte also implemented a groundwater monitoring program. As part of the program, Del Monte installed a basal groundwater monitoring well network, as shown in Figure 0-22. Del Monte collects and analyzes quarterly groundwater samples from the basal groundwater monitoring well network and monthly groundwater samples from the KWTS.

1.8.3. Institutional Controls

A Consent Decree was lodged on June 8, 2007 (EPA, 2007) that requires monitoring of institutional controls (ICs) at the site to verify that property owners and lessees have not undertaken any construction in the source area or the well restriction area that has damaged or interfered with basal groundwater monitoring or extraction wells. Following is the summary of the ICs in the Consent Decree:

Restrictions to the Source Area:

- The Source Area shall not be used in any manner that causes a threat to public health. Until Certification of Completion of the Work by EPA, the Source Area cannot be used or redeveloped for residential use; used as a hospital, school for people aged 21 and under, or day care center; or other uses by sensitive receptors, as defined by EPA's risk assessment.
- Construction is not permitted on the Source Area that damages or interferes with any equipment or other components of the Perched Aquifer and Deep Soil Remedy, including the vegetative soil cap, groundwater extraction and monitoring wells and conveyance pipelines, the soil vapor extraction system, the phytoremediation treatment units, and the basal groundwater treatment system.

Restrictions to the Well Restriction Area:

- Prior to Certification of Completion of the Work by EPA, an application cannot be filed for a Water-Use Permit to draw water from a well located in the Well Restriction Area without prior written approval of EPA. The owner shall notify EPA as well as the Hawaii Commission on Water Resource Management and shall file an objection to the issuance of a Water-Use Permit with the Water Resource Management Commission.
- Prior to Certification of Completion of the Work by EPA, construction is not permitted in the Well Restriction Area that damages or interferes with any equipment or other components of the Basal Aquifer Remedy, including the groundwater monitoring wells.
- In order to assist EPA in monitoring the effectiveness of the institutional controls at the Site, an Institutional Controls Annual Report will be submitted annually to EPA.
- Prior written approval of EPA is needed for modification of ICs in the Consent Decree, including modification to the boundaries of the Site or Well Restriction.

1.9. Operation and Maintenance

Del Monte, with EPA oversight, is conducting long-term operation and maintenance (O&M) and monitoring of the remediation systems at the Site. O&M activities are being conducted in accordance with the following EPA approved documents:

- Draft Final Operations and Maintenance for the Kunia Well Pump and Treat System. Groundwater Extraction, Del Monte Corporation (Oahu Plantation) Superfund Site (Golder, 2006).
- Final O&M Manual for the Kunia Well Pump-and-Treat System, Del Monte Corporation (Oahu Plantation) Superfund Site (Golder, 2008).
- Operations and Maintenance Manual for the Perched Groundwater Remediation System, Del Monte Corporation (Oahu Plantation) Superfund Site (Golder, 2009)
- Compliance Monitoring Plan, Del Monte Corporation (Oahu Plantation) Superfund Site (Golder, 2009).

Current O&M and compliance monitoring reporting requirements are quarterly for both the perched and basal remediation systems, and annually for the ICs. Every three years, a cumulative basal groundwater monitoring report is also required.

1.9.1. Basal Aquifer Treatment System

The Kunia Well and KWTS have been in full-scale operation since September 2005 and, through April 2014, have treated approximately 2.1 billion gallons of groundwater. The KWTS was designed to treat up to 1,000 gallons per minute (gpm) of groundwater extracted from the Kunia Well for basal groundwater plume capture and source control. However, it was determined that a 1,000-gpm pump would not fit in the Kunia Well, so a smaller, 750-gpm pump was installed. The pump achieved 750 gpm during startup but eventually decreased to approximately 720 gpm. The Kunia Well pumping rate was further reduced to an average continuous rate of 500 gpm based on a capture zone analysis and data evaluation indicating that the Kunia Well pump can be off for 45 days before loss of plume capture occurs (see Final O&M Manual for the Kunia Well Pump-and-Treat System, Del Monte Corporation (Oahu Plantation) Superfund Site, Golder, 2008)

Beginning in 2008, extracted perched groundwater, which contains much higher concentrations of COCs than basal groundwater, was blended with the extracted basal groundwater and treated by the KWTS, rather than by the phytoremediation system. In January 2009, monthly KWTS performance sampling analytical results indicated that GAC removal efficiency had dropped below 50 percent, resulting in breakthrough of COCs above Hawaii MCLs in treated effluent. The KWTS was shut down and spent bituminous GAC was removed and replaced with a new coconut-based GAC. The KWTS resumed operation in February 2009. Spent GAC from the KWTS was determined to contain listed hazardous wastes (EDB and DBCP). The GAC (approximately 16 tons) was transported to and disposed of at a permitted hazardous waste disposal facility in Oregon (there are no hazardous waste facilities in Hawaii) at a cost of about $37,000. Current monitoring data indicate the new GAC is performing well.

Beginning in about 2007, periodic malfunctions of submersible pumps in several of the basal groundwater monitoring wells were encountered due to corrosion and leaks in the steel discharge pipes in the wells. With EPA approval, all submersible pumps were removed from basal monitoring wells and replaced with dedicated point-source bailers, which should result in O&M cost savings and more reliable quarterly basal monitoring data.

In November 2012, an additional background well (BWM-7) was installed to provide additional empirical data on the background concentrations of COCs present in the basal aquifer. Initial groundwater quality samples for BMW-7 were collected in January 2013. During 2013, the two background wells (BMW-6 and BMW-7) were sampled bi-monthly.

With EPA's consent, the groundwater monitoring frequency was reduced to annual for all basal monitoring wells screened within the Ewa-Kunia Aquifer, which include BMW-3, the Hawaii Department of Land and Natural Resources (DLNR) Ewa-Kunia Middle Deep Monitoring Well, and the DLNR Mauka Deep Monitoring Well. This reduction was effective following the January 2013 sampling round.

1.9.2. Perched Aquifer Treatment System

Although perched groundwater extraction to reduce COCs in the perched groundwater and minimize infiltration to the basal aquifer has been ongoing at the Site since the 1980s, the full-scale perched aquifer remediation system consisting of groundwater extraction, SVE, a vegetated soil cap, and storm water controls began operation in late 2008.

There have been minor issues with the wells and pumps that are part of the perched aquifer treatment system, but, with general maintenance and repairs, the systems are working as intended. Perched groundwater is primarily pumped from the White Tank to the Kunia Well Treatment System at approximately 20 gallons per minute. At least once a week, perched groundwater is pumped from the White Tank to the phytoremediation system. Extracted groundwater is also directed to the phytoremediation system when the KWTS is down for maintenance.

COCs removed by the SVE system are captured using air phase carbon.

A total of approximately 2 million gallons of groundwater were extracted and treated from 2010 to 2014. Currently, minor and routine adjustments are being made to the SVE system (cycling operation between headers) and perched groundwater extraction pumps to increase extraction efficiency. No significant or unexpected issues have been identified.

1.9.3. O&M Costs

The original O&M present value cost estimate for the perched aquifer treatment system was $1,590,000 (Golder, Feasibility Study Report for the Del Monte Corporation (Oahu Plantation) Super Fund Site, 2003). The original O&M present value cost estimate for the basal aquifer treatment system, including post-closure monitoring, was $5,580,000 for 30 years (Golder, 2003). Table 0-2 summarizes the actual O&M costs for the review period of 2010 through 2014.

Table 0-2. Annual O&M Costs

Date Range	Total Cost (rounded to the nearest $1,000)
2010	$1,008,000
2011	$959,000
2012	$1,143,000
2013	$962,000
2014	$691,000

Progress Since the Last Five-Year Review

1.10. Previous Five-Year Review Protectiveness Statement and Issues

The protectiveness statement from the 2010 FYR for the Del Monte Corporation (Oahu Plantation) Site (Site) stated the following:

> The remedy for the Del Monte Superfund Site is protective of human health and the environment because there is no exposure to untreated perched or basal aquifer groundwater. Furthermore, the Hawaii Department of Health prohibits any use of the basal groundwater, even for irrigation, without treatment, unless the groundwater meets State of Hawaii MCLs.

The 2010 FYR included one issue and recommendation. Due to the presence of background concentrations of COCs (EDB, DBCP, and 1,2,3-TCP) in basal groundwater above Hawaii MCLs, it does not currently appear feasible that phased extraction (pump and treat) of basal groundwater in the Kunia Village Source Area (KVSA) will eliminate the source of COCs and reduce basal groundwater COC concentrations to less than Hawaii MCLs. The recommendation and current status is indicated in Table 0-1 and discussed below.

Table 0-1. Status of Recommendations from the 2010 FYR

Issues from previous FYR	Recommendations	Action Taken and Outcome	Date of Action
Existence of Background COC Concentrations	Review the necessity of re-evaluating the remedial action objectives for the Basal Aquifer Remedy	Installed background well BMW-7 and performed various investigations, analyses and evaluations to confirm, evaluate, and quantify the background COCs present in the basal aquifer. Results are reported in the Background Concentrations of Chemicals of Concern in the Basal Aquifer report (Golder, 2014).	July 2014

1.11. Work Completed at the Site During this Five-Year Review Period

1.11.1. Evaluation of Background Concentrations of Contaminants of Concern in the Basal Aquifer

Various investigations, analyses, and evaluations were completed to confirm, evaluate, and quantify the background COCs present in the basal aquifer. The report, "Background Concentrations of Chemicals of

Concern in the Basal Aquifer (Golder, 2014)," presents a summary of the previous background studies and provided numerical background concentrations for each of the COCs. Background COC concentrations were determined using groundwater monitoring data collected from the two basal groundwater monitoring wells that were purposely located in portions of the Waiawa-Waipahu aquifer that could not be impacted by releases from the KVSA. BMW-6 installed approximately 1,700 feet east (hydrologically cross-gradient) of the KVSA and BMW-7 located approximately 1,300 feet directly upgradient of the KVSA, provide data used to calculate the background COC concentrations (Figure 0-6).

Data was collected from BMW-6 and BMW-7 during 2013 and 2014 to calculate background concentrations. Procedures described in the EPA document, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance (EPA 2009), were used to calculate background levels using the combined data. In accordance with the guidance document, upper tolerance limits with a 95 percent coverage and 95 percent confidence level were calculated for the BMW-6 and BMW-7 groundwater monitoring data. Data collected from Kunia Well, BMW-1, BMW-2, BMW-4, BMW-5 and HCC well in April 2014 was compared to the calculated background upper tolerance limit.

In summary, background concentrations are above Hawaii MCLs for EDB, DBCP, and 1,2,3-TCP. The current COC concentrations present in the KVSA for EDB, DBCP, and 1,2-DCP are near background levels. In the KVSA wells, DBCP concentrations are slightly above background levels and EDB and 1,2,3-TCP concentrations are well below background levels. These data were not available when the ROD was drafted, and therefore, the presence of background COCs at concentrations above MCLs was not factored into the remedial selection process.

1.11.2. Evaluation of Monitored Natural Attenuation Remedial Alternative for the Basal Aquifer

In consideration of the background COC concentrations and the current site conditions, the Evaluation of Monitored Natural Attenuation (MNA) Remedial Alternative document evaluates the implementation of MNA as a remedial alternative for the basal aquifer. The evaluation addressed factors discussed in EPA's guidance, Use of Monitored Natural Attenuation at Superfund RCRA Corrective Action, and Underground Storage Tank Sites. The document evaluates several Site specific criteria for determining if natural attenuation is appropriate as the remedial action at the site including:

- Source control has been conducted to the maximum extent practicable
- There is evidence that natural biodegradation or chemical degradation is occurring and will continue to occur at a reasonable rate
- The estimated restoration time frame for natural attenuation is reasonable compared to that of a other more active cleanup action alternatives
- Leaving contaminants on-site during the restoration time frame does not pose an unacceptable threat to human health or the environment. There is no current or projected use of, or demand for, the affected groundwater during the restoration time frame, or alternative water supplies are available.

Unacceptable risks to human health, ecological health, and sensitive receptors, considering current and future land and water uses, have been mitigated.

- Appropriate monitoring requirements are conducted to ensure that the natural attenuation process is taking place and that human health and the environment are protected.
- The plume has reached steady-state and is no longer advancing
- Sustainability Evaluation

The evaluations performed indicate that transitioning the Basal Aquifer Remedy to MNA would be protective of human health and the environment. The original sources of COCs to the basal aquifer have been controlled by remedial activities performed in the perched aquifer and through nearly continuous basal aquifer capture zone produced by the groundwater extraction system in the KVSA since 2005. Groundwater monitoring data collected prior to the start of the basal groundwater extraction indicated a steep reduction in EDB and DBCP concentrations, which occurred under natural attenuation conditions. COC reductions are reaching asymptotic levels in the basal aquifer wells that have COC concentrations that are similar to the background COC concentrations. Groundwater monitoring data collected over the last two years indicate reductions in DBCP concentrations in BMW-2 and BMW-4; although the DBCP concentrations are higher than background in these two wells. Concentration trend monitoring and groundwater fate and transport modeling indicate the plume has reached steady state. Although it may require 15 to 20 years for all of the compounds to naturally attenuate to levels that are indistinguishable from background COC levels, numerous regulatory restrictions and institutional controls are in place to prevent exposure to impacted basal groundwater during the remediation time frame.

1.11.3. Proposal for Trial Shutdown

Based on the results from the Background Concentration Evaluation and MNA Evaluation, Del Monte Fresh Produce (Hawaii) Inc. requested, and EPA has approved, a trial shutdown of the Kunia Well basal groundwater extraction and treatment system. The purpose of the trial shutdown is to gather data on the concentrations of COCs detected in the basal aquifer monitoring wells and to evaluate concentration trends in the basal wells under nonpumping conditions.

The trial shutdown began in November 2014 and will continue for approximately two years. Evaluation of concentration trends under MNA will require at least two years of groundwater monitoring data to allow for trend or statistical evaluations. During the trial period, quarterly groundwater monitoring will be collected from all basal monitoring wells including: KVSA wells; downgradient wells, and background wells. During the two year shutdown the perched groundwater remedial actions will continue to operate to control COCs migrating to the underlying basal aquifer.

Five-Year Review Process

1.12. Administrative Components

EPA Region 9 initiated the FYR in September 2014 and scheduled its completion for June 2015 The EPA review team was led by Christopher Lichens of EPA, Remedial Project Manager (RPM) for the Del

Monte Corporation (Oahu Plantation) Superfund Site (Site), and also included the EPA site attorney. On September 24, 2014, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place.

1.13. Community Involvement

On June 2, 2015 a public notice was published in the Honolulu Star Register announcing the commencement of the Five-Year Review process for the Del Monte Corporation (Oahu Plantation) Site, providing Chris Lichens' contact information, and inviting community participation. The press notice is available in Appendix B. No one contacted EPA as a result of this advertisement.

The Five-Year Review report will be made available to the public once it has been finalized. Copies of this document will be will also be available online at epa.gov/region09/delmonte.

1.14. Document Review

1.14.1. Applicable or Relevant and Appropriate Requirements Review

Section 121 (d)(2)(A) of CERCLA specifies that Superfund RAs must meet any federal standards, requirements, criteria, or limitations that are determined to be legally Applicable or Relevant and Appropriate Requirements (ARARs). ARARs are those standards, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

The following ARARs selected remedy have not changed since the last Five Year Review; and therefore, do not affect protectiveness:

- RCRA Hazardous Waste Definition Standards (HAR Title 11) are applicable federal ARARs for determining whether soil from well construction or groundwater extracted from the perched aquifer and basal aquifer is a hazardous waste.
- Safe Drinking Water Act: MCLs under the SDWA are relevant and appropriate requirements for the basal aquifer (see Table 6-1 for MCLs).
- Water Quality Protection Plan: Under the SDWA and RCRA, a significant issue in identifying ARARs for groundwater is whether the groundwater can be classified as a source of drinking water. The basal aquifer at the Site can be classified as a Class II aquifer and is a potential source of drinking water.
- RCRA Groundwater Protection Standards (HAR Title 11, Chapter 264-94): These regulations provide that compounds must not exceed their background levels in groundwater or some higher concentration limit set as part of the corrective action program.
- Primary MCLs (40 C.F.R 141.61 (a)): The federal MCL for DCP has been determined to be a relevant and appropriate requirement for basal groundwater cleanup. Primary State MCLs are set forth in HAR Title 11, Chapter 20 - Potable Water System Regulations. The State MCLs for EDB and DBCP are more stringent than the Federal MCLs. In addition, the State of Hawaii has established an MCL for 1,2,3-TCP, whereas the Federal regulations do not include an MCL for

this compound. As such, the State MCLs for these three compounds are relevant and appropriate for basal groundwater at the Del Monte Site.

- Resource Conservation and Recovery Act (RCRA) - HAR Title 11 Chapter 260-268
- RCRA Hazardous Waste Characterization, Generation, Storage, Transportation, and Treatment (HAR Title 11 Chapter 261, 262, 264)
- Monitoring (HAR Title 11 Chapter 264-100)
- Federal Insecticide, Fungicide, and Rodenticide Act (3 and 40 CFR Part 152 Subparts C and D)

Table 0-1. Summary of Safe Drinking Water Act

Contaminants of Concern	2003 ROD EPA Cleanup Standard (µg/L)	Current Federal EPA MCL (µg/L)		Current Hawaii State MCL (µg/L)	ARARs Changed?
EDB	0.04[a]	5		0.04	No
DBCP	0.04[a]	0.2		0.04	No
1,2,3-TCP	0.6[a]	--		0.6	No
1,2-DCP	5[b]	5		5	No

a. State of Hawaii MCL
b. Federal EPA MCL

Federal and state laws and regulations that have been changed over the past five years are described in Table 0-2. The table does not include those ARARs identified in the ROD that are no longer pertinent, now that the response action has transitioned from construction to long-term Operations, Maintenance and Monitoring (OM&M) phase work. For example, ARARs that related to remedial design and construction are not included in the table if they do not continue into long-term OM&M. There have been no revisions to laws and regulations that affect the protectiveness of the remedy.

Table 0-2. Applicable or Relevant and Appropriate Requirements Evaluation

Requirement And Citation	**Document**		**Effect on Protectiveness**	**Comments**	**Amendment Date**
Hawaii Air Pollution Control Standards: HAR Title 11, Chapter 60	ROD	Hawaii Air Pollution Control Standards: Address discharge of air pollution including visible emissions, fugitive dust, incineration, process industries, sulfur oxides from fuel combustion, storage of VOCs, VOC separation from water, and waste gas disposal.	Changes to this requirement do not affect protectiveness.	The regulation requires permits for point sources and treatment systems that exceed 0.1 tons per year of each hazardous air pollutant. The substantive provisions of these regulations will be applicable for any action that includes air discharges exceeding this threshold. At this stage, it does not appear likely that either the air stripper (basal aquifer) or the SVE treatment unit (perched aquifer) will have discharges approaching the 0.1 tons per year threshold	HAR 11-60.1 was revised on April 7, 2004 to add EDB and DBCP to the list of hazardous air pollutants (HAP).

1.14.2. Human Health Risk Assessment Review

A human health risk assessment was completed for the Del Monte Corporation Superfund Site (Site) as part of the 1999 Baseline Risk Assessment (BRA). The risk assessment identified the exposure pathways at the Site as occupational and domestic use of untreated groundwater including ingestion, inhalation, and dermal exposure.

The risk assessment identified the following exposure pathways:

- Hawaii Country Club (HCC) golf course maintenance/irrigation workers: Inhalation exposure to untreated HCC Well water
- Future hypothetical Kunia Section irrigation workers and residents: Inhalation (for spray irrigation workers) and dermal contact (for drip irrigation workers) exposure to contaminants from the use of Kunia Well water without treatment.
- Hypothetical, future residents at 1.5 miles downgradient, 3 miles downgradient and 4.5 miles downgradient of the Kunia Village Area (KVA): Ingestion, inhalation, and dermal contact to untreated contaminated groundwater

1.14.3. Vapor Intrusion

An additional potential pathway that was not addressed in the BRA is VOC vapors migrating from impacted soil or groundwater to air inside buildings. The potential for vapor intrusion is evaluated following a "multiple lines of evidence" approach consistent with EPA's April 2013 "External Review Draft – Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air." Target groundwater concentrations were determined using the Vapor Intrusion Screening (VISL) Calculator developed by EPA. For unlimited use, target indoor air concentrations are based on an adult residential exposure scenario , and a target risk of $1x10^{-6}$ or 1 in 1,000,000 for chemicals with carcinogenic health effects. For current restricted use, target concentrations are based on industrial exposure and a target risk of $1x10^{-4}$ or 100 in 1,000,000 for chemicals with carcinogenic health effects. Screening levels were calculated using a target risk of $1x10^{-6}$ or 1 in 1,000,000 for chemicals with carcinogenic health effects and a target hazard quotient of 1 for chemicals with noncarcinogenic health effects. Table 0-3 provides the vapor intrusion screening levels and Hawaii MCLs for the COCs at the Site.

Table 0-3: Comparison between Vapor Intrusion Screening Levels and Hawaii MCLs

Chemical	Target Groundwater Concentration for Vapor Intrusion Screening - Residential (μg/L)	Target Groundwater Concentration for Vapor Intrusion Screening - Industrial (μg/L)	April 2014 Basal Aquifer Monitoring Wells (max.)	April 2014 Perched Aquifer Monitoring Wells (max.)	Hawaii State MCL (μg/L)
EDB	0.15	77	0.043	7.7	0.04
DBCP	0.027	34	0.46	27	0.04
1,2,3-TCP	22	9400	1.7	2.3	0.6
1,2-DCP	2.1	1100	0.84	140	5

The most recent monitoring data from the perched aquifer and basal aquifer monitoring wells indicate that concentrations for EDB, DBCP, and 1,2-DCP are above the target concentrations generated by the VISL calculator for residential use. According to EPA's guidance for evaluating vapor intrusion (EPA 2013), buildings that are not within 100 ft laterally and/or vertically of the contamination plume are generally not considered to be an issue. Contamination in the basal aquifer is approximately 850 ft bgs; therefore, vapor intrusion from COCs in the basal aquifer would not be considered an issue for current vapor intrusion. Currently, there are no homes or businesses located above or within 100 ft of the contamination in the perched aquifer. The Site is currently used for The Institutional Controls on the property restricts construction while the remedy is implemented.

In addition, the MCLs are lower for EDB and 1,2,3-TCP which means cleaning up groundwater to the MCLs will be protective of potential future residents exposed to COCs through vapor intrusion. To evaluate the protectiveness of DBCP and 1,2-DCP for the vapor intrusion pathway, a risk calculator was used to determine the vapor intrusion carcinogenic risk for the MCLs. The vapor intrusion risk values for DBCP and 1,2-DCP are $1.5x10^{-6}$ and $2.4x10^{-6}$, respectively. Both of these values are within EPA's acceptable risk range ($1x10^{-4}$ to $1x10^{-6}$). Therefore, cleaning up the groundwater to MCLs will be protective of potential future residents exposed to COCs in groundwater through vapor intrusion.

However, the exposure pathway of residual vadose contamination to indoor air through vapor intrusion was not considered in the original risk assessment. In fact, the remedy selected mass reduction goals such that the residual COC mass in soil and groundwater would be reduced to levels protective of groundwater only. These cleanup goals may not be protective of future residents exposed to potential vapor intrusion from vadose zone contaminant.

1.14.4. Toxicity Values

EPA's Integrated Risk Information System (IRIS) includes a program to update toxicity values used by the Agency in risk assessment when newer scientific information becomes available. In the past five years, there have been a number of changes to the toxicity values for COCs at the Site. Groundwater concentration results are compared to EPA's Regional Screening Levels (RSLs) as a first step in determining whether response actions may be needed to address potential human health exposures. The RSLs are chemical-specific concentrations for individual contaminants that correspond to an excess cancer risk level of $1x10^{-6}$ (or a Hazard Quotient of 1 for noncarcinogens), and they have been developed for a variety of exposure scenarios (e.g., residential, commercial/industrial). RSLs are not de facto cleanup standards for a Superfund site, but they do provide a good indication of whether actions may be needed.

Toxicity values for EDB, DBCP, 1,2,3-TCP and 1,2-DCP have changed since the ROD. Comparing the ROD remediation standards to EPA's RSLs can be helpful in determining whether response actions may be needed to address potential human health exposures. RSLs are determined using the most recent toxicity values. Table 0-4 illustrates how toxicity value changes may affect protectiveness.

EPA uses an excess cancer risk range between 10^{-4} and 10^{-6} for assessing potential exposures. The RSLs summarized in Table 0-4 represent the concentration at which cancer risk is 10^{-6}. All of the COCs have cancer RSLs below ROD cleanup levels; however, two of the cleanup levels are still within EPA's protective excess cancer risk range of 10^{-4} to 10^{-6}. The cleanup level of 0.04 µg/L for DBCP is still above the upper excess cancer risk range of 0.00033 to 0.033 µg/L, indicating that the cleanup level for DBCP may not be protective. Basal aquifer groundwater DBCP concentrations collected in April 2014 range from 0.13 to 0.68 µg/L. These concentrations are well above the MCL and the cancer risk range and may affect future protectiveness if the basal aquifer is used for domestic water. The cleanup level of 0.6 µg/L for 1,2,3-TCP is still above the upper excess cancer risk range of 0.00075 to 0.075 µg/L, indicating that the cleanup level for 1,2,3-TCP may not be protective. Basal aquifer groundwater 1,2,3-TCP concentrations collected in April 2014 range from 0.79 to 1.9 µg/L. These concentrations are well above the MCL and the cancer risk range and may affect future protectiveness if the basal aquifer is used for domestic water.

Table 0-4: Summary of Groundwater RSLs January 2015 for COCs at the Site

Contaminant of Concern	Regional Screening Level for cancer risk in excess of $1x10^{-6}$ (µg/L)[a]	Regional Screening Level for noncancer hazard (µg/L)[b]	Protective Cancer Risk Range (µg/L)	Selected Cleanup Level-Hawaii MCLs (µg/L)	Is the Selected Cleanup Level within EPA's Protective Risk Range
EDB	0.0075	17	0.0075 to 0.75	0.04	Yes
DBCP	0.00033	0.37	0.00033 to 0.033	0.04	No
1,2,3-TCP	0.00075	0.62	0.00075 to 0.075	0.6	No
1,2-DCP	0.44	8.3	0.44 to 44	5	Yes

a. Tap water multipathway cancer RSL (Carcinogenic Target Risk=$1x10^{-6}$).

b. Tap water multipathway child noncancer RSL (Hazard index=1).

1.14.5. Ecological Review

In the BRA, ecological risks were evaluated qualitatively because very few shallow soil and sediment samples contained detectable concentrations of COCs and because contaminated perched groundwater typically occurs at depths of 50 to 80 feet bgs and does not discharge to surface water. Also, KVA does not provide critical habitat for threatened or endangered species and typical location-specific laws and regulations that apply to wetlands and historic places are not ARARs to this site. Therefore, the qualitative screening assessment concluded that there are no realistic exposure pathways for ecological receptors and no unacceptable risk. Because site conditions have not changed since completion of the BRA, the conclusion that there are no exposure pathways for ecological receptors is still valid, and no unacceptable risk is attributable to the KVA.

1.15. Data Review

This FYR evaluated data from each of the two parts of the EPA's selected remedy: 1) remediation of the shallow groundwater (perched aquifer) and contaminated soil in the KVA from approximately 20 feet bgs to 100 feet bgs, and 2) remediation of the deep groundwater (basal aquifer). EPA's goal is to prevent perched aquifer and deep soil contaminants from further contaminating the basal aquifer, and to prevent future exposure to contaminated groundwater from the basal aquifer (EPA, 2003).

1.15.1. Perched Groundwater Data

The Perched Aquifer and Deep Soil Remedy includes extracting and treating the perched aquifer groundwater with phytoremediation and treating deep soil with the soil vapor extraction (SVE) system. This FYR reviewed trends in the COCs to evaluate the performance of the remedy. Water levels and groundwater extraction volumes were measured in the active perched groundwater extraction wells on a weekly basis. Water levels in all site wells are measured monthly and during quarterly perched groundwater monitoring events. The full-scale perched groundwater extraction and treatment system was completed in July 2008, and includes SVE wells, groundwater extraction wells, dual phase groundwater/SVE-extraction wells, and monitoring wells. The Kunia Well Source Area and the location of the wells are shown on Figure 0-3 and Figure 0-1.

The perched well type designations are as follows:

- SVE wells - Extraction wells located within portions of the source area that no longer contain extractable quantities of perched water that were constructed to serve as SVE wells.
- Groundwater extraction wells - Wells located generally upgradient of the source area that were constructed as groundwater extraction wells to reduce lateral migration of perched groundwater into the source area.
- Dual-phase groundwater/SVE wells - Extraction wells located within portions of the source area containing perched water that were constructed to extract perched groundwater and conduct SVE simultaneously.
- Groundwater monitoring wells - Wells located just outside the perched groundwater source area that serve as monitoring wells during groundwater sample collection.

Perched groundwater is primarily pumped from the White Tank to the Kunia Well Treatment System (KWTS) at approximately 20 gallons per minute (gpm). At least once a week, perched groundwater is pumped from the White Tank to the phytoremediation system to maintain the trees. Extracted groundwater is also directed to the phytoremediation system when the KWTS is down for maintenance. The perched groundwater extraction system is purposefully switched off for 2 days prior to quarterly groundwater sampling to allow the groundwater to recharge sufficiently to permit collection of groundwater samples.

The groundwater extraction system in the perched aquifer will operate until the COC mass in soil and groundwater has been reduced such that the source area contamination no longer would result in exceedances of MCL in basal aquifer groundwater. The performance standard for the perched aquifer is mass reduction. This will require that DBCP mass be reduced by 95 percent and that EDB and 1,2-DCP mass be reduced by 75 percent.

The mass estimated during the Remedial Investigation/Feasibility Study (RI/FS) is 28 kilograms (kg) of DBCP and 11 kg of EDB. An initial mass estimate for 1,2-DCP was not developed during the RI/FS. A 2008 technical memorandum estimated the initial mass of 35 kg DBCP, 11 kg EDB, and 26 kg 1,2-DCP.

As of June 3, 2014, since the start of full-scale SVE operation in July 2008, the SVE system has removed the following COC masses:

- 54.66 kilograms (kg) of 1,2-DCP (210 percent reduction from 26 kg).
- 2.9 kg of DBCP (10 percent reduction from 29 kg, 8 percent reduction from 35 kg).
- 0.5 kg of EDB (4.5 percent reduction from 11 kg).

During the past five years of cumulative mass removal, the SVE system was effective at removing 1,2-DCP, and removed 210 percent of the initial mass estimate. 1,2-DCP does not, and has never, exceeded the MCL in the basal aquifer. The system was less effective at removing DBCP and EDB from the perched aquifer, only removing 10 percent of DBCP and 4 percent of EDB. All three COCs have reached an asymptotic concentration level (see Figure 0-2 for mass removal graphs). Removal of 95 percent DBCP and 75 percent EDB is unlikely to occur within the initial restoration timeframe estimate of eight years. The ROD states that the remediation timeframe for the perched aquifer is a key uncertainty. The perched aquifer remediation timeframe, the effectiveness of DBCP and EDB mass removal, and the DBCP and EDB percent reduction performance criteria should be re-evaluated.

The data reviewed for this five year review (FYR) includes groundwater data from the past five years in the extraction wells and monitoring wells listed in Table 0-5. These data are from the quarterly perched groundwater monitoring events from January 2010 to July 2014. Only wells with adequate water levels are sampled. For example, during the April 2014 sampling event, only 6 wells contained enough water for sampling (Table 0-6). Twenty-four wells were sampled at least one during the review period, and 8 of the 24 wells had less than 3 samples each during the review period. The perched aquifer wells were tested using a less precise method for all the COCs which means many of the samples are close to the method limits.

Table 0-5: Perched Aquifer Wells with Data from Jan. 2010 to July 2014

Well ID	Well Type	# of Samples	# of Exceeds EDB	# of Exceeds DBCP	# of Exceeds 1,2,3-TCP	# of Exceeds 1,2-DCP
EW-02	Dual	1	1	1	0 (1U)	1
EW-10	Dual	2	2	2	2	2
EW-13	Dual	2	2	2	0	2
EW-14	Dual	2	1 (1 U)	0 (2 U)	0 (2 U)	0
EW-15	Dual	7	7	6, (1 U)	3	6
EW-16	Dual	11	5 (5 U)	0 (11 U)	0 (8 U)	8
EW-28	Dual	1	1	1	0 (1U)	1
EW-31	Dual	7	1 (6 U)	0 (7 U)	0 (6 U)	1
EW-32	Dual	5	5	4	2	4
EW-33	Ground water only	18	17	2 (16 U)	17	8
EW-34	Dual	3	3	3	2	2
EW-35	Dual	3	2 (1 U)	2 (1 U)	1 (2 U)	3
EW-36	Dual	20	1 (19 U)	1 (19 U)	16	1
EW-37	Dual	16	15 (1 U)	15 (1U)	15	15
EW-38	Dual	10	8 (2 U)	10	10	10
EW-41	Dual	15	13 (2 U)	7 (8 U)	1 (1 U)	6
EW-42	Dual	14	14	14	14	14
HW-03	Groundwater only	19	0 (19 U)	0 (19 U)	0	0
MW-05	Monitoring*	2	0 (2 U)	0 (2 U)	0 (1 U)	0
MW-06	Monitoring*	7	0 (7 U)	0 (7 U)	0 (7 U)	0 (7 U)
MW-13	Dual	21	19 (2 U)	21	7 (3 U)	20
MW-18	Dual	13	13	13	12	13
MW-23	Monitoring*	19	0 (19 U)	0 (19 U)	3	0
MW-24	Monitoring*	19	2 (17 U)	0 (19 U)	0 (7 U)	0 (4 U)
White Tank		20	20	19 (1 U)	3 (3 U)	20

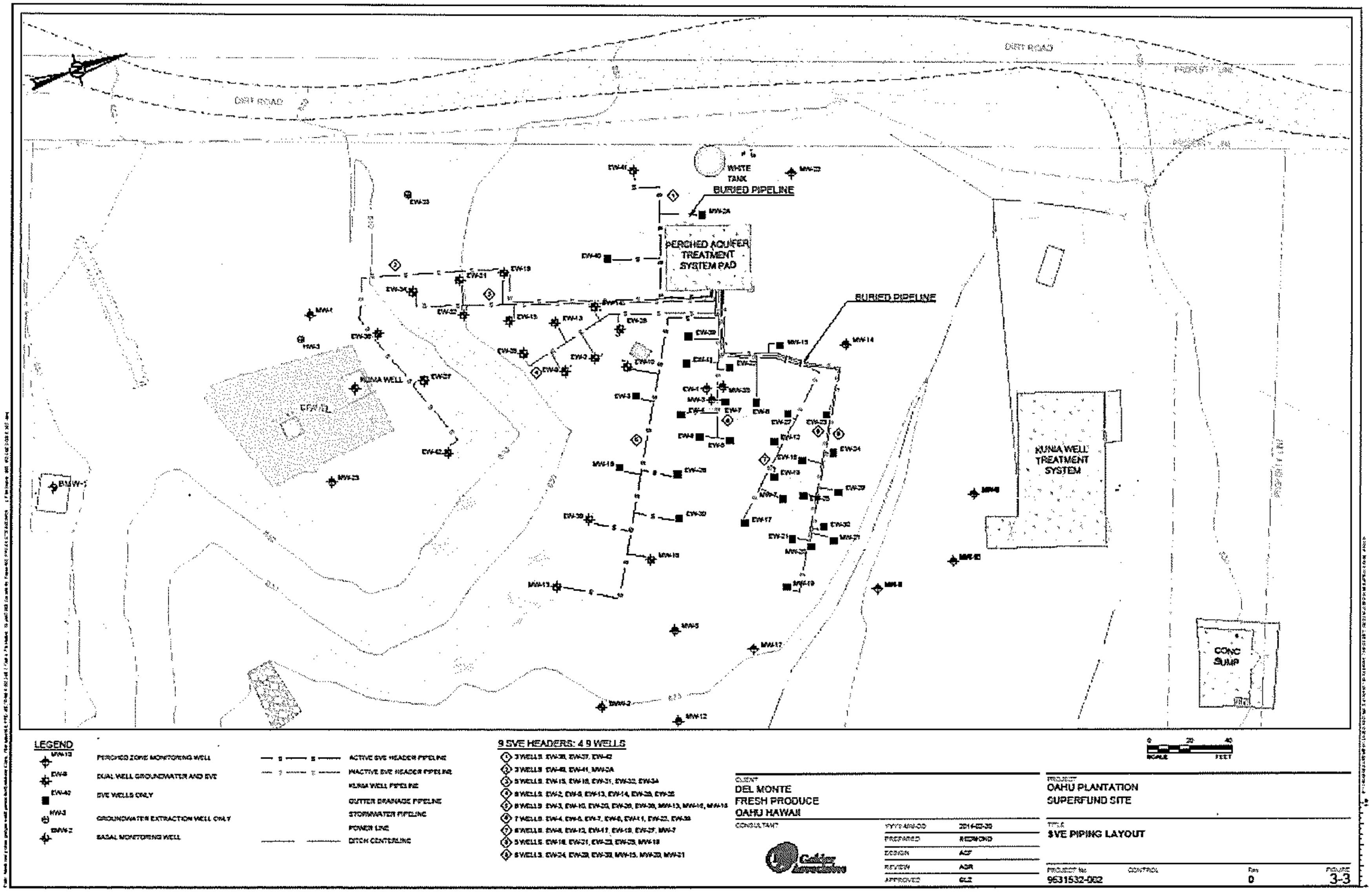
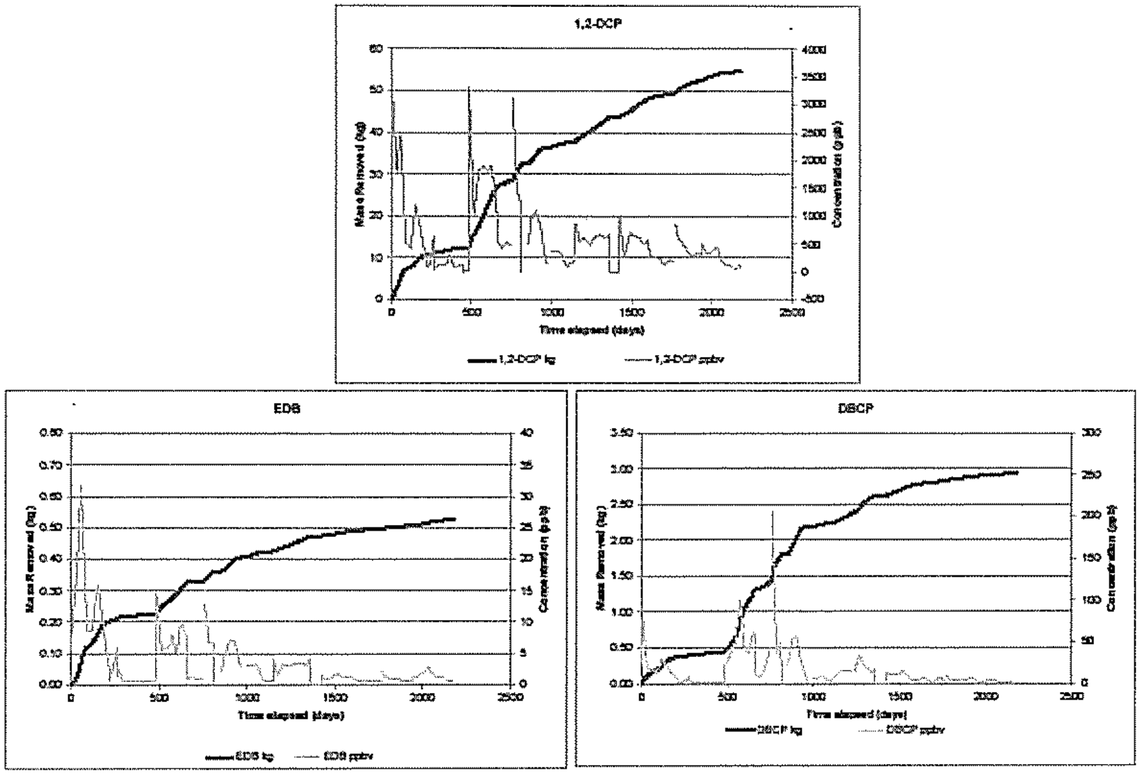


Figure 0-1: Kunia Well Source Area, Perched Aquifer SVE Piping Layout (Golder, 2014).

COMBINED CONCENTRATION AND CUMULATIVE MASS REMOVED



Note:
SVE operations timeline shown on associated table titled "Influent After Blower SVE Offgas Sample Results".

072514gc1_Appendix D.xlsx

Golder Associates

Figure 0-2: Mass Removal Graphs for 1,2-DCP, EDB, and DBCP, July 2014.

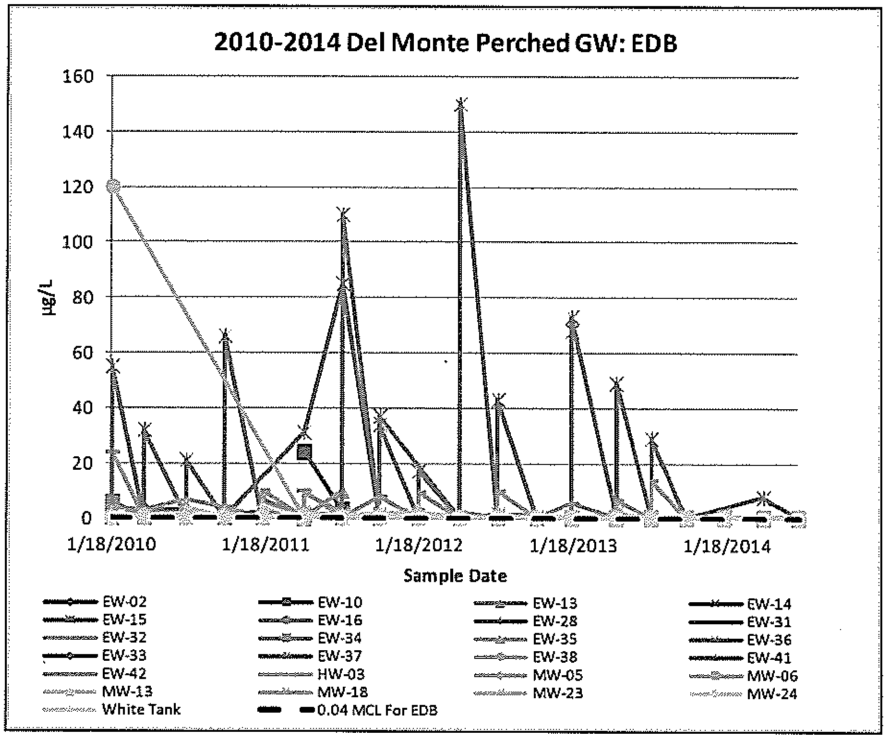


Figure 0-3: EDB Results for Perched Groundwater Jan. 2010-July 2014.

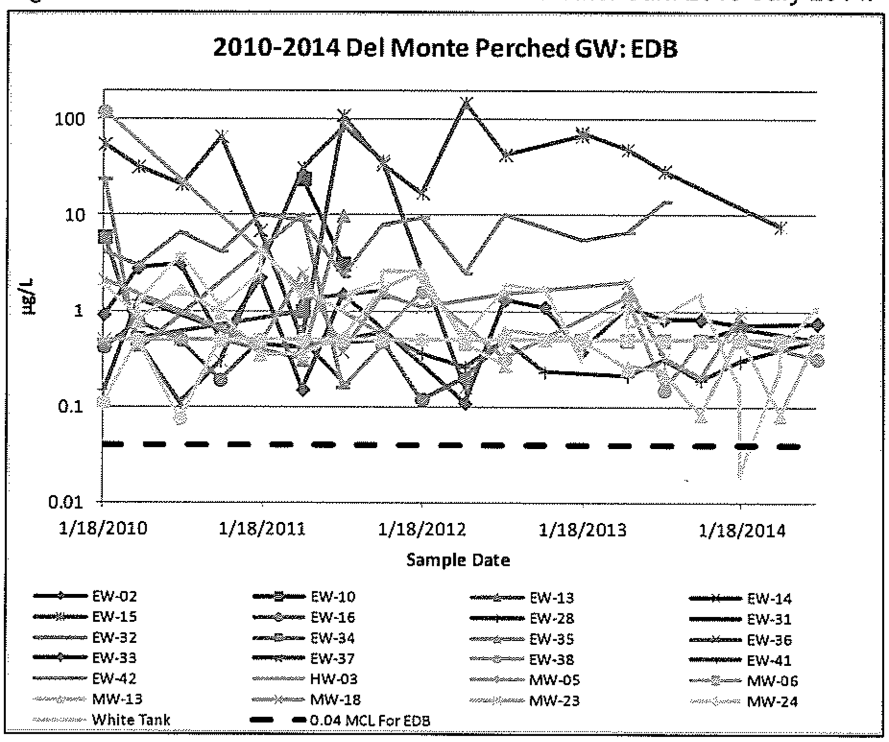


Figure 0-4: EDB Results for Perched Groundwater Jan. 2010-July 2014, Log Scale.

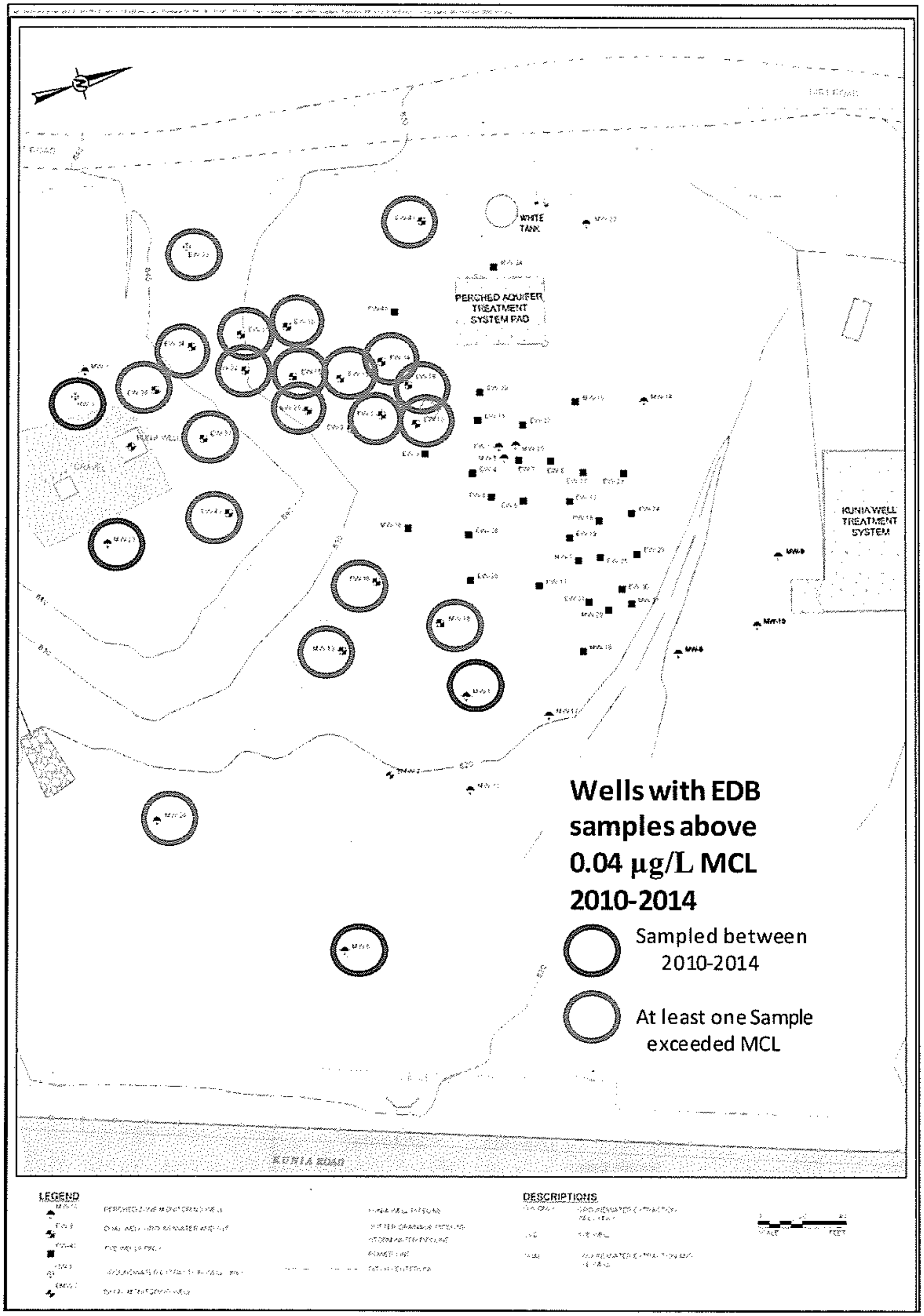


Figure 0-5: Map of Perched Wells that Exceeded the EDB MCL.

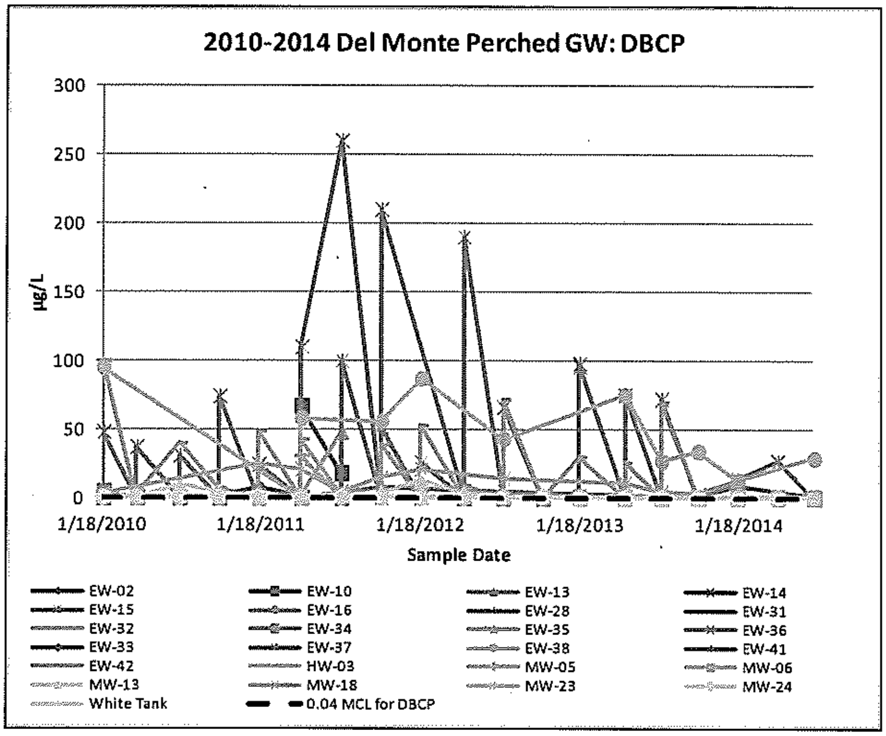


Figure 0-6: DBCP Results for Perched Groundwater Jan. 2010-July 2014.

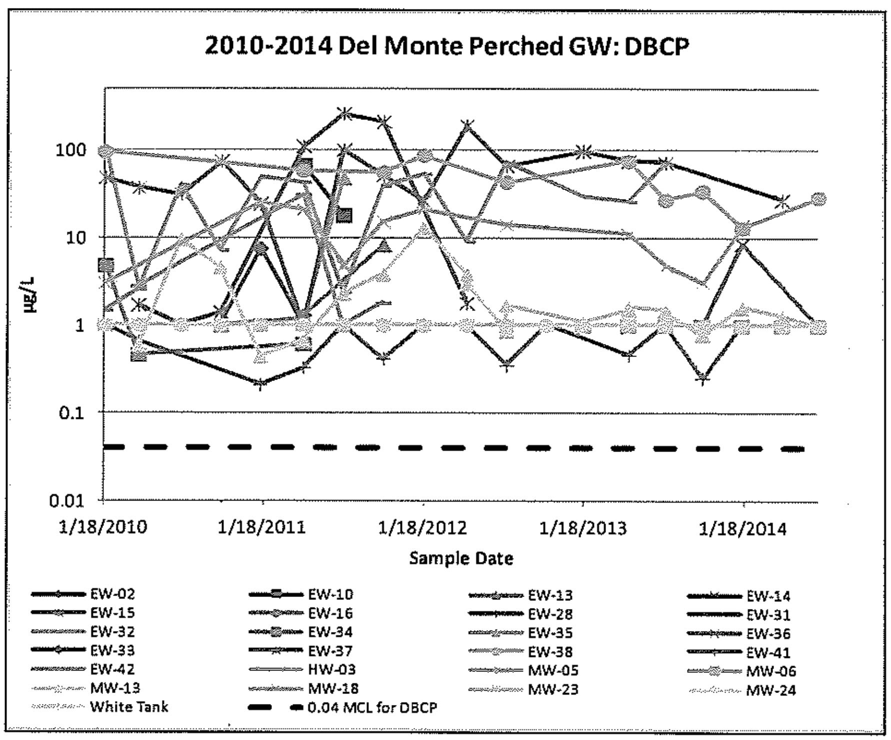


Figure 0-7: DBCP Results for Perched Groundwater Jan. 2010-July 2014 (Log Scale).

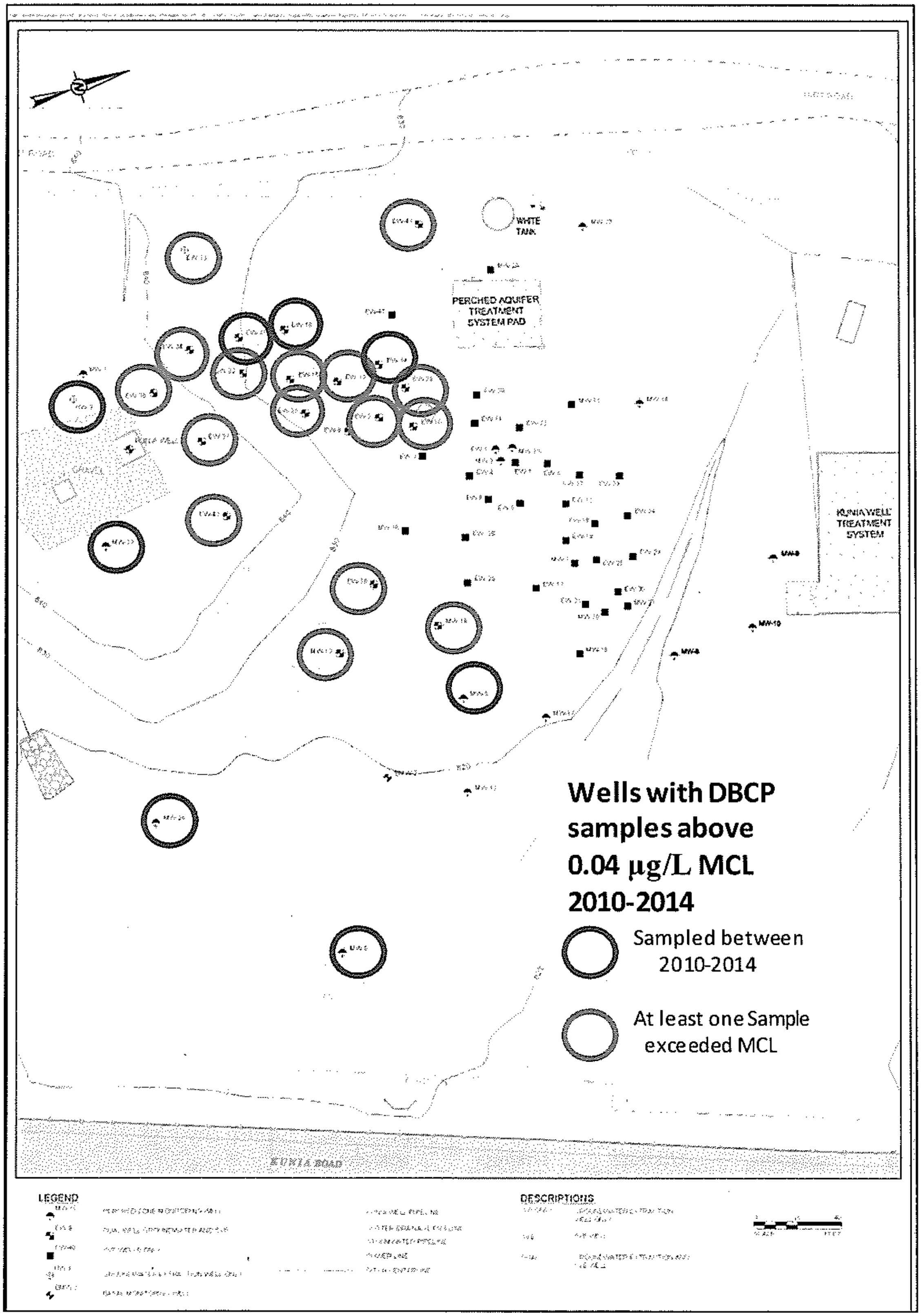


Figure 0-8: Map of Perched Wells that Exceeded the DBCP MCL.

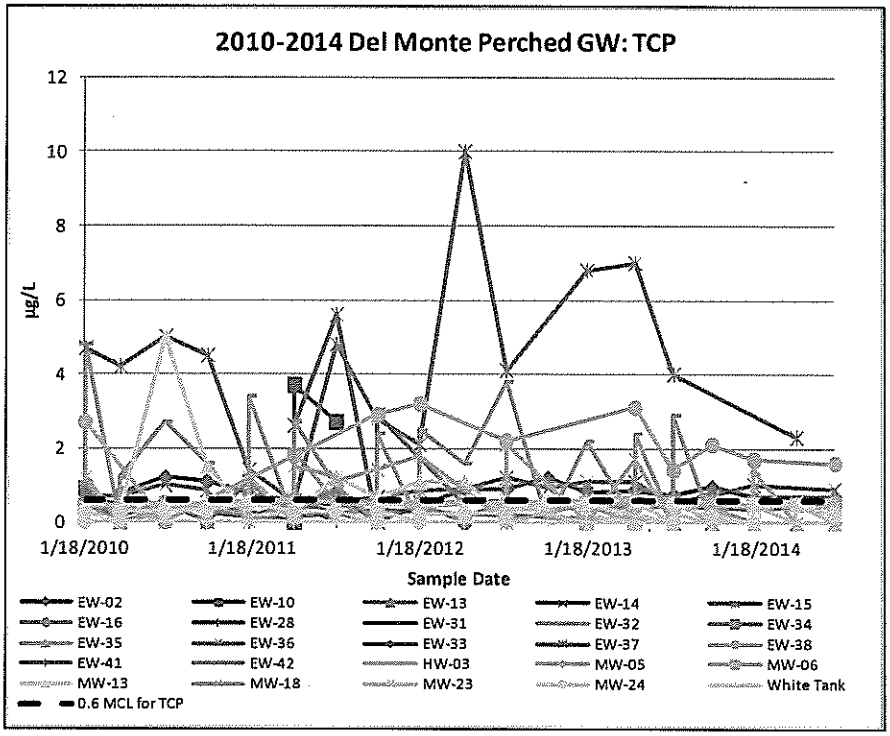


Figure 0-9: 1,2,3-TCP Results for Perched Groundwater Jan. 2010-July 2014.

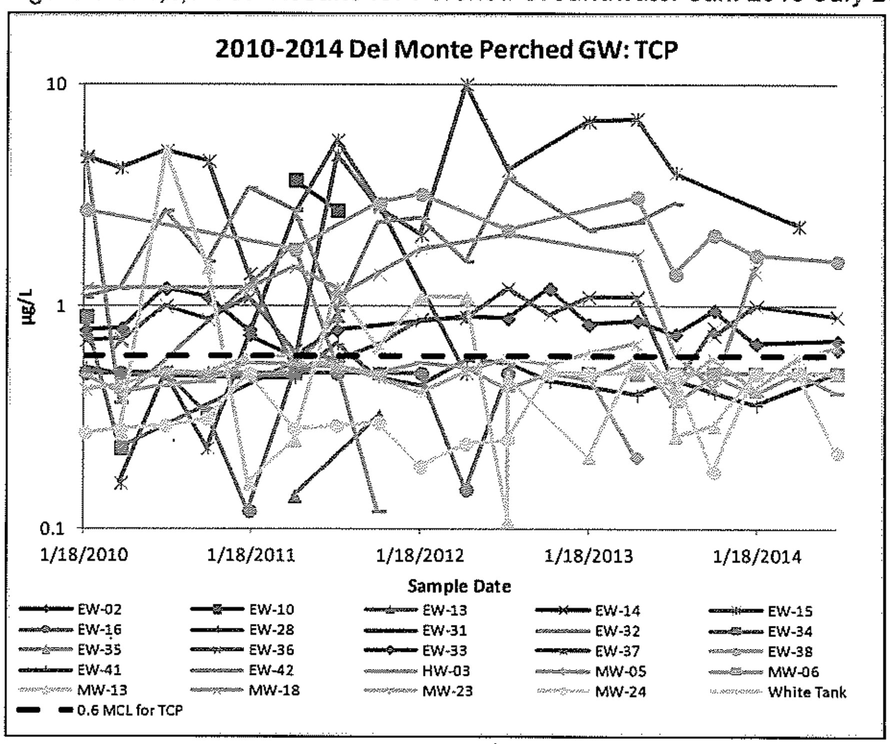


Figure 0-10: 1,2,3-TCP Results for Perched Groundwater Jan. 2010-July 2014 (Log Scale).

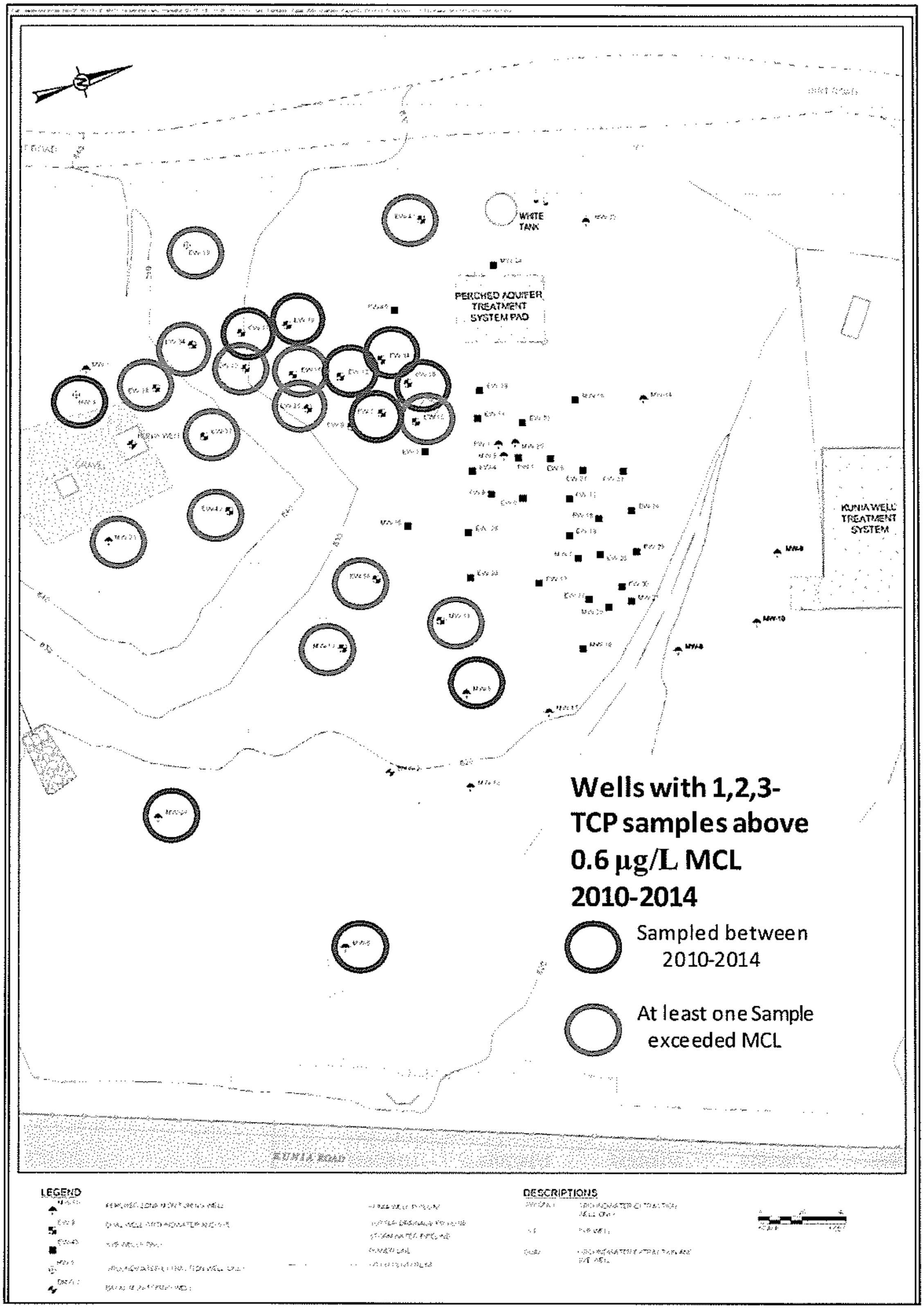


Figure 0-11: Map of Perched Wells that Exceeded the 1,2,3-TCP MCL.

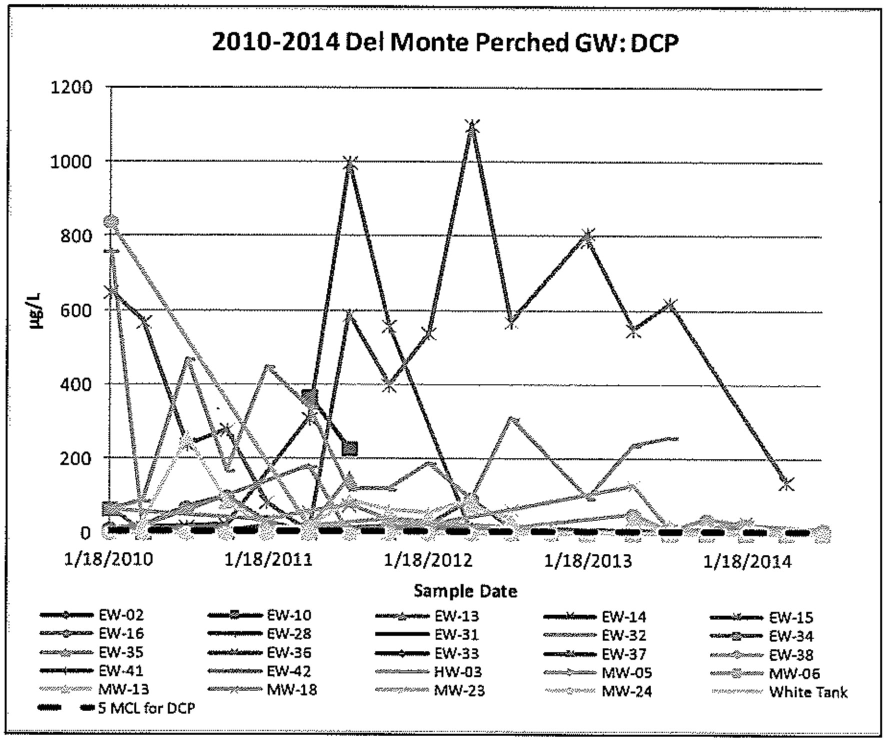


Figure 0-12: 1,2-DCP Results for Perched Groundwater Jan. 2010-July 2014.

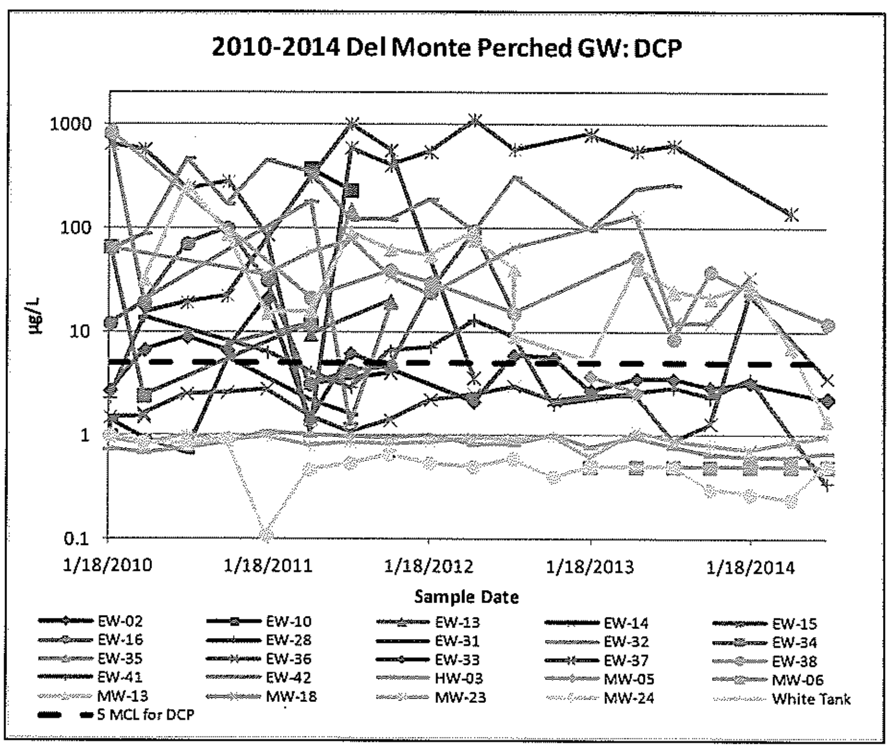


Figure 0-13: 1,2-DCP Results for Perched Groundwater Jan. 2010-July 2014 (Log Scale).

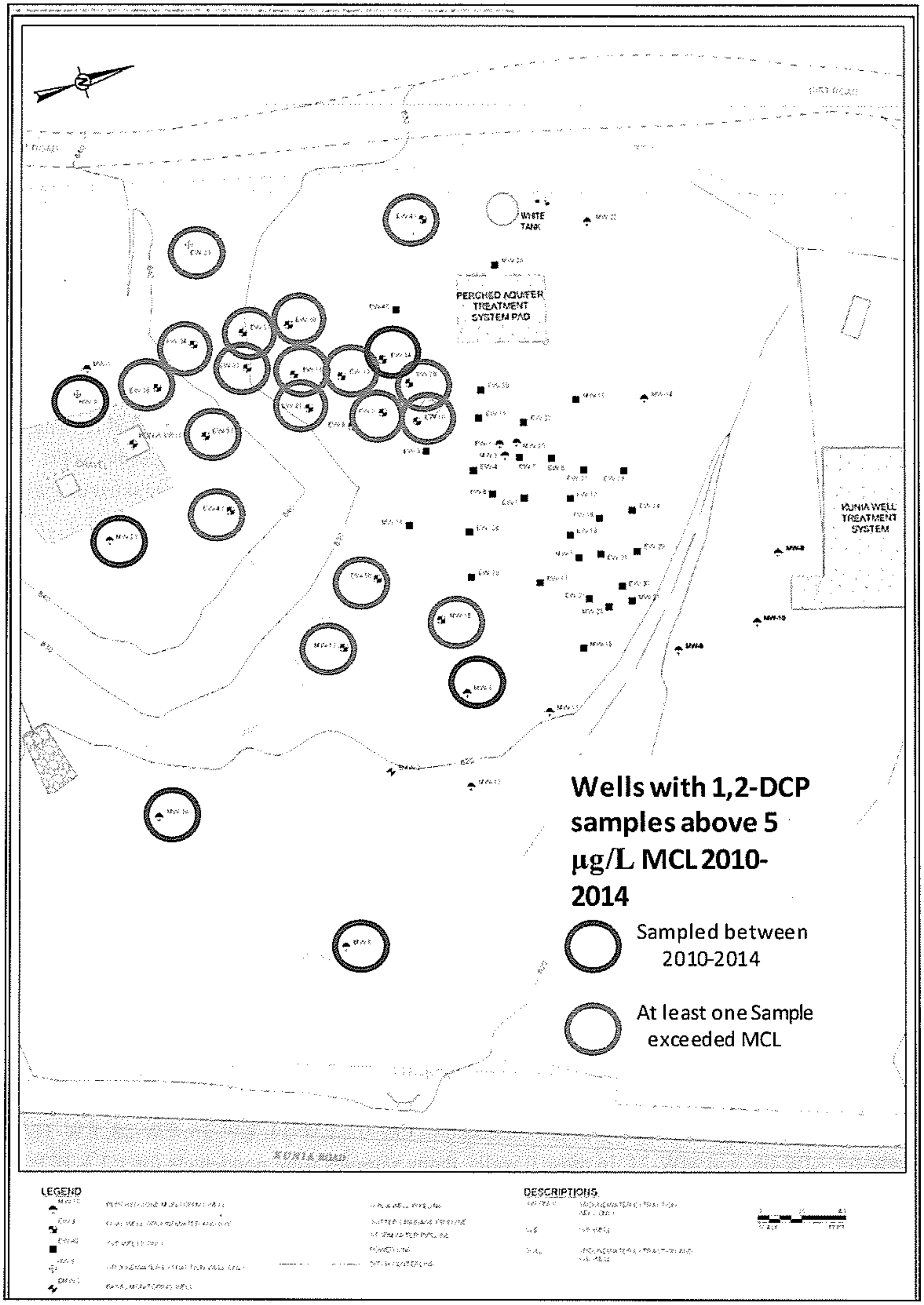


Figure 0-14: Map of Perched Wells that Exceeded the 1,2-DCP MCL.

EDB

The sampling results for EDB during the past five years are shown on Figure 0-3 and Figure 0-4. The locations of the wells that exceeded the MCL during the period covered in this FYR are shown on Figure 0-5. Every EW well sampled had at least one event above the 0.04 MCL for EDB. MW-13 and MW-18 exceeded the MCL during almost every reading. MW-23 and HW-03 had no detections of EDB. EW-31, EW-36, had one detection, and MW-24 had two detections. EW-38 and EW-37 both had samples above 100 µg/L. EW-37 had the most samples with high concentrations of EDB. Every sample from EW-37 over the past five years was above 6.9 µg/L and two samples were over 100 µg/L. EW-37 is the closest perched aquifer well to the Kunia Well. The concentrations of EDB detected at EW-37 increased from 2010 to 2012, then decreased from 2012 until 2014, but are not below the MCL. EDB concentrations at EW-38 decreased during the past five years, but are not below the MCL. EW-42 has the next highest concentration, with levels of EDB ranging from 3 to 10 µg/L. Concentrations of this COC at EW-42 are increasing. MW-13 and MW-05 concentrations of EDB have decreased. During the April 2014 reading, only 6 wells were sampled and concentrations at EW-37 and MW-13 exceeded the MCL. Some wells have decreasing concentrations of EDB, but the concentrations of EDB exceed the MCL in most of the sampled perched aquifer wells.

DBCP

The sampling results for DBCP during the past five years are shown Figure 0-6 and Figure 0-7. The locations of the wells that exceeded the MCL during the period covered in this FYR are shown Figure 0-8. DBCP was not detected in HW-03, MW-05, MW-06, MW-23, and MW-24. The MCL was not exceeded in EW-14, EW-16, EW-31, HW-03, MW-05, MW-06, and MW-24. Nineteen wells had at least one sample that exceeded the MCL. Of these, 15 had more than 3 sample events and 11 had more than 3 samples exceed the MCL for DBCP. Seventeen of the 24 wells were sampled more than 3 times. Of these 17 wells, DBCP concentrations exceeded the MCL in every sample in EW-38, EW-42, MW-13, and MW-18. The DBCP exceeded the MCL in every almost every sample (with one nondetect) in EW-15, EW-32, and EW-37. The concentration of DBCP in the wells has fluctuated during the past five years, with some wells, like EW-37, increasing and then decreasing within the review period. During the April 2014 reading, only six wells were sampled and EW-37 and MW-13 exceeded the MCL.

1,2,3-TCP

The sampling results for 1,2,3-TCP during the past five years are shown in Figure 0-9 and Figure 0-10.The locations of the wells that exceeded the MCL during the period covered in this FYR are shown on Figure 0-11. The MCL for 1,2,3-TCP was not exceeded in EW-02, EW-14, EW-16, EW-28, EW-31, HW-03, MW-05, MW-06, and MW-24. In those 9 wells, many samples were nondetects for 1,2,3-TCP, and any detections had concentrations of 1,2,3-TCP below the MCL. Fourteen wells had at least one sample that exceeded the MCL for 1,2,3-TCP (EW-10, EW-15, EW-32, EW-34, EW-34, EW-35, EW-36, EW-37, EW-38, EW-41, EW-42, MW-13, MW-18, and MW-23), of these, 11 wells had more than 3 samples. Nine wells had more than 3 samples each that exceeded the MCL for 1,2,3-TCP. The concentration of 1,2,3-TCP is not increasing, but some wells had concentrations of 1,2,3-TCP above the MCL. During the April 2014 reading, only 6 wells were sampled and only EW-37 exceeded the MCL.

1,2-DCP

The sampling results for 1,2-DCP during the past five years are shown in Figure 0-12 and Figure 0-13. Figure 0-14. The locations of the wells that exceeded the MCL during the period covered in this FYR are shown on Figure 0-14. 1,2-DCP MCL was exceeded in at least one sample in 18 wells, of these, 12 had more than 3 samples, and 10 wells had more than 3 samples that exceeded the MCL. During the April 2014 reading, only 6 wells were sampled and EW-37 and MW-13 exceeded the MCL.

Table 0-6: April 2014 Perched Aquifer Sampling Results

Contaminant of Concern	EDB (µg/L) 0.04	DBCP (µg/L) 0.04	1,2,3-TCP (µg/L) 0.6	1,2-DCP (µg/L) 5
EW-37 (4/16/2014)	7.7	27	2.3	140
HW-03 (4/16/2014)	0.5 (U)	1 (U)	0.5	0.62
MW-06 (4/16/2014)	0.5 (U)	1 (U)	0.5 (U)	0.5 (U)
MW-13 (4/16/2014)	0.082	1.3	0.5 (U)	7.1
MW-23 (4/16/2014)	0.5 (U)	1 (U)	0.58	0.86
MW-24 (4/16/2014)	0.5 (U)	1 (U)	0.5 (U)	0.24
Sump Pump A (4/15/2014)	0.019 (U)	0.0095 (U)	0.5 (U)	0.5 (U)
Sump Pump B (4/15/2014)	0.019 (U)	0.0095 (U)	0.5 (U)	0.5 (U)
White Tank (4/15/2014)	0.38	1.7	0.5 (U)	7.7

Note: Highlighted text indicates the sample exceeded the MCL.

The groundwater extraction system of the perched aquifer is effective at removing water from this area. Sampling for COC concentrations in the perched aquifer were inconsistent due to data gaps from the dewatering. EDB, DBCP, and 1,2,3-TCP, and 1,2-DCP exceeded the MCLs. Concentrations increased then decreased in some wells. The variations in sampling results are likely caused by the fluctuating water elevations.

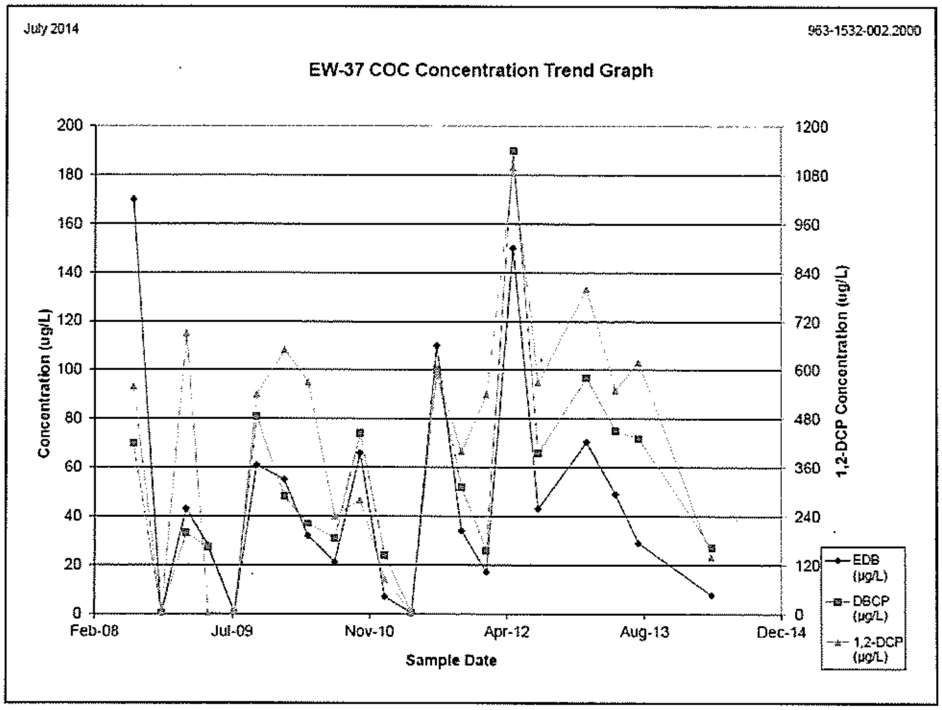


Figure 0-15: EW-37 2008 - April 2014 (Golder 2014).

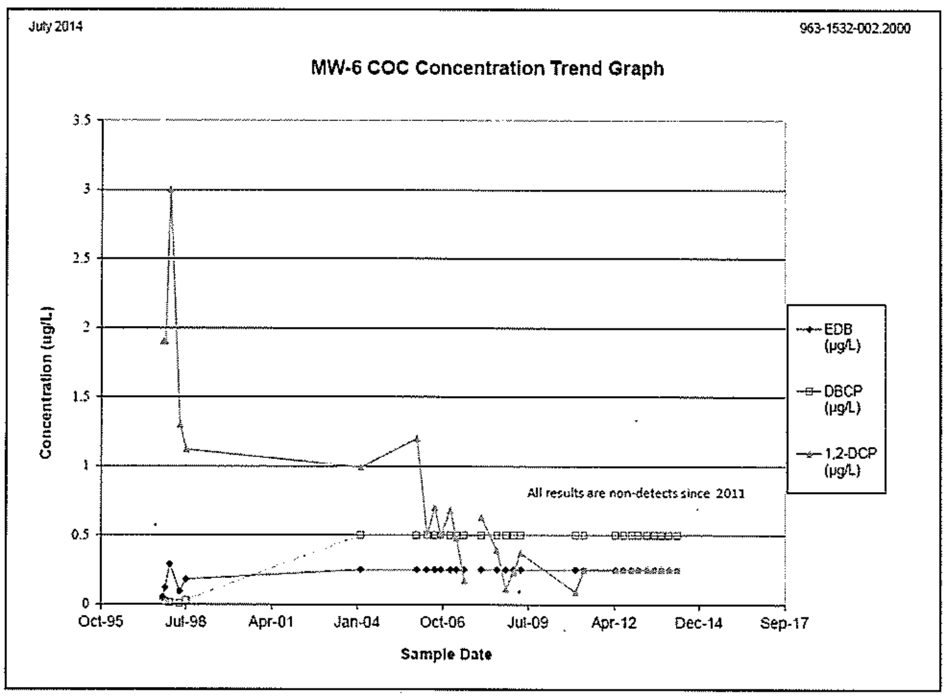


Figure 0-16: MW-6 1997 - April 2014 (Golder, 2014).

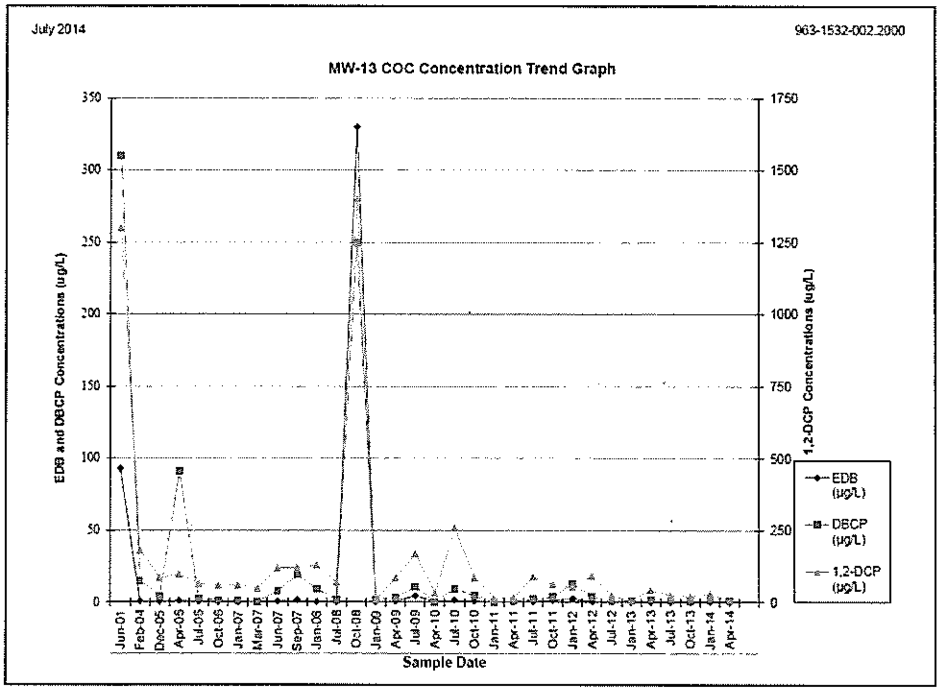


Figure 0-17: MW-13 April 2001 - April 2014 (Golder, 2014).

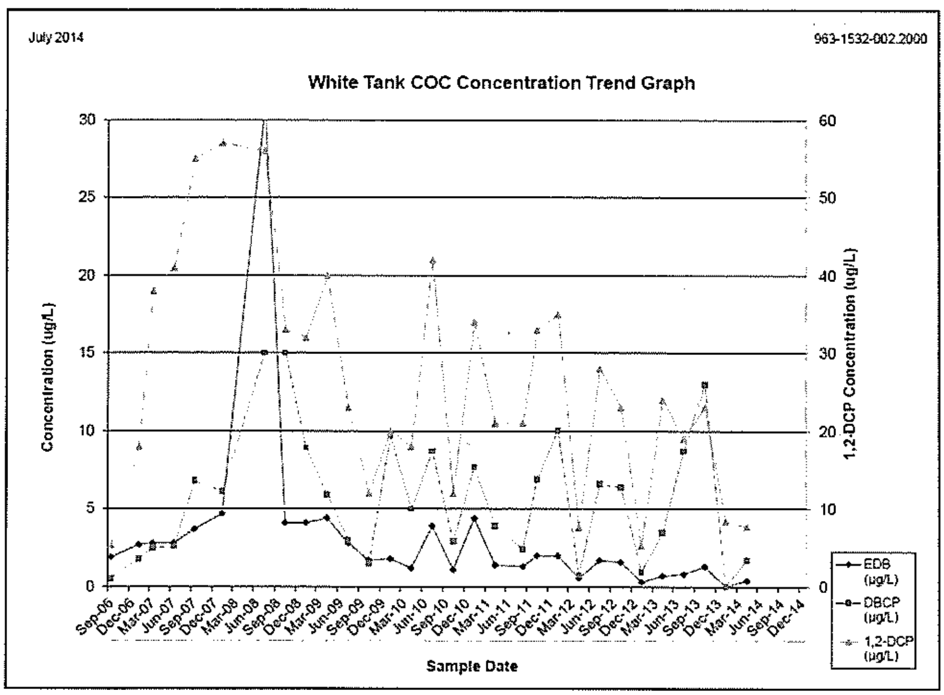


Figure 0-18: White Tank, Sept 2006 - April 2014 (Golder, 2014).

1.15.2. Basal Groundwater Data

The Basal Aquifer Remedy includes extracting water from the Kunia Well and monitoring extracted groundwater from the Kunia Well and from downgradient wells. This FYR reviewed trends in the COCs to evaluate the performance of the Basal Aquifer Remedy. The basal aquifer was sampled approximately four times a year between January 2010 and June 2014 in wells: BMW 1, 2, 3, 4, 5, 6, 7, at the HCC well, and at the Kunia Well in the KVSA. Not all locations were sampled each quarter during this time period. BMW-7 was installed in November 2012. BMW-6 and BMW-7 are background wells that monitor concentrations of the COCs in the Waiawa-Waipahu aquifer upgradient of the Site. The locations of the sampled wells are shown on Figure 0-22.

The Kunia Well, BMW-1, BMW-2, BMW-4, BMW-5, BMW-6, and BMW-7 are all located in the Waiawa-Waipahu aquifer system. The HCC well is the nearest production well potentially downgradient of the KVA in the Waiawa-Waipahu aquifer system. BMW-3 is the only well constructed in the Ewa-Kunia aquifer. Sampling frequency was reduced in BMW-3 in January 2013 because COCs have not been detected in the Ewa-Kunia aquifer since monitoring began in 2005 (Golder, 2014).

This FYR reviewed data from the past five years. The FYR team found it difficult to evaluate how well the remedy is performing without comparing the current data to the initial concentrations at the wells. The team reviewed graphs with a longer duration to evaluate the change from initial condition. Sampling results for all wells since the Kunia Well began pumping in 2005 are shown on graphs from the most recent quarterly groundwater monitoring report. Graphs from the report indicate groundwater extraction from the perched aquifer began in June 2008. Some graphs in the report (Figure 0-19 and Figure 0-20) demonstrate the history of the Kunia Well and BMW-1 from 1997 until 2014. For these two figures, 1,2,3-TCP is on another axis. These two wells have the longest history, going back eight years before the Kunia Well began pumping.

If the remedy is performing as intended, then these two events, the start of pumping of the Kunia Well and the start of perched groundwater extraction, should be the two events that most decrease the COCs' concentrations. However, the concentrations of EDB and DBCP decrease the most between 1997 and 2005, before the Kunia Well began pumping. The concentrations of EDB, DBCP, and 1,2,3-TCP then decrease initially with the start of Kunia Well pumping; thereafter, between September 2005 and June 2008, the concentrations increase. Once the perched groundwater extraction begins in June 2008, it appears that the increase in concentration levels stops. The results become inconsistent; different wells and different COCs fluctuate without decreasing further. The concentrations of EDB, DBCP, and 1,2,3-TCP are not below the MCLs. Figure 0-19 demonstrates that concentrations of 1,2,3-TCP in the Kunia Well in 2014 are higher than in 1997. EDB and DBCP concentrations appear to have decreased since the initial 1997 measurements, and 1,2-DCP appears at about the same concentration as 1997.

Table 0-7: Basal Monitoring Wells Locations

Area	Well ID	Location
Up Gradient (Background)	BMW-7	1,300 ft directly up-gradient of Kunia Well
Cross-Gradient (Background)	BMW-6	1,700 ft east of the Kunia Well
KVSA	Kunia Well	
	BMW-2	220 ft east of the Kunia Well
Down Gradient	BMW-1	150 ft south of Kunia Well
	BMW-4	4100 ft south of the Kunia Well
	HCC	~8,400 ft south of Kunia Well
	BMW-5	2.6 miles south of the Kunia Well
Ewa-Kunia Aquifer	BMW-3	4,500 ft south-east of the Kunia Well

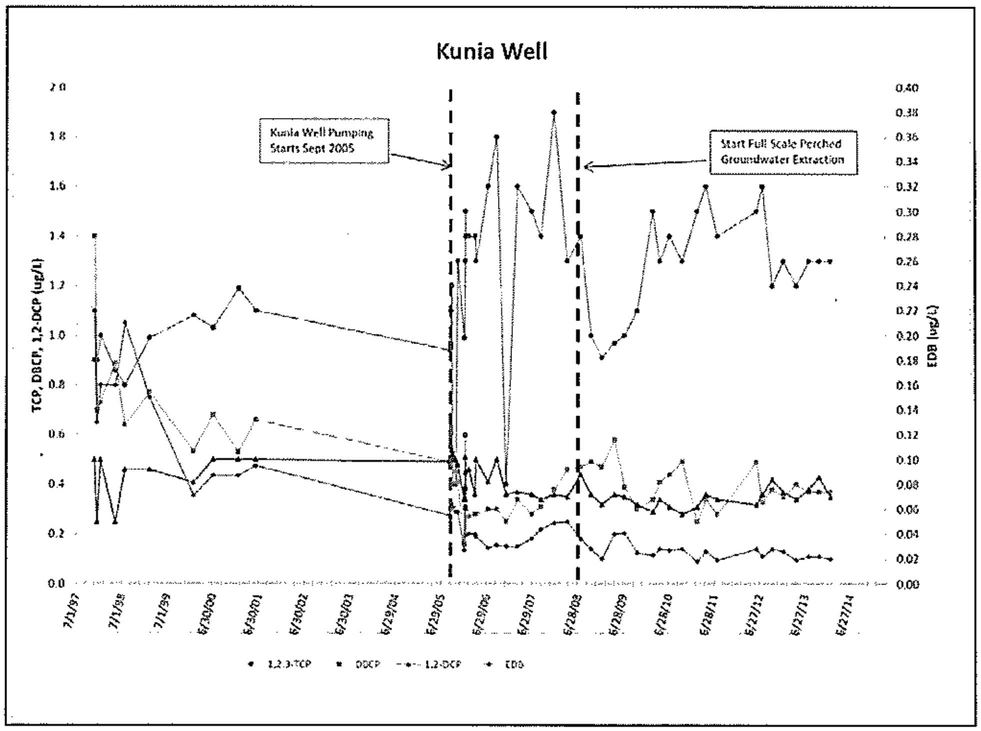


Figure 0-19: Kunia Well 1997 to 2014 (Golder, 2014).

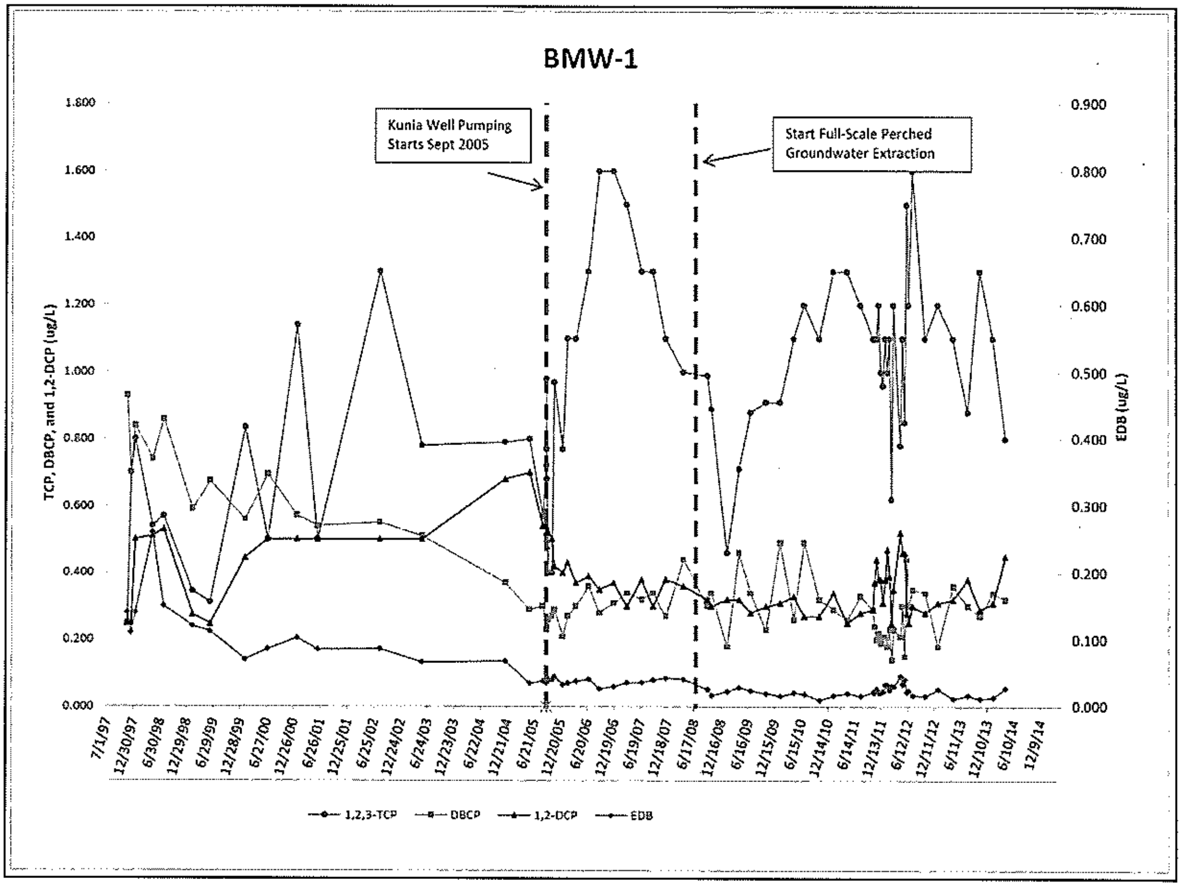
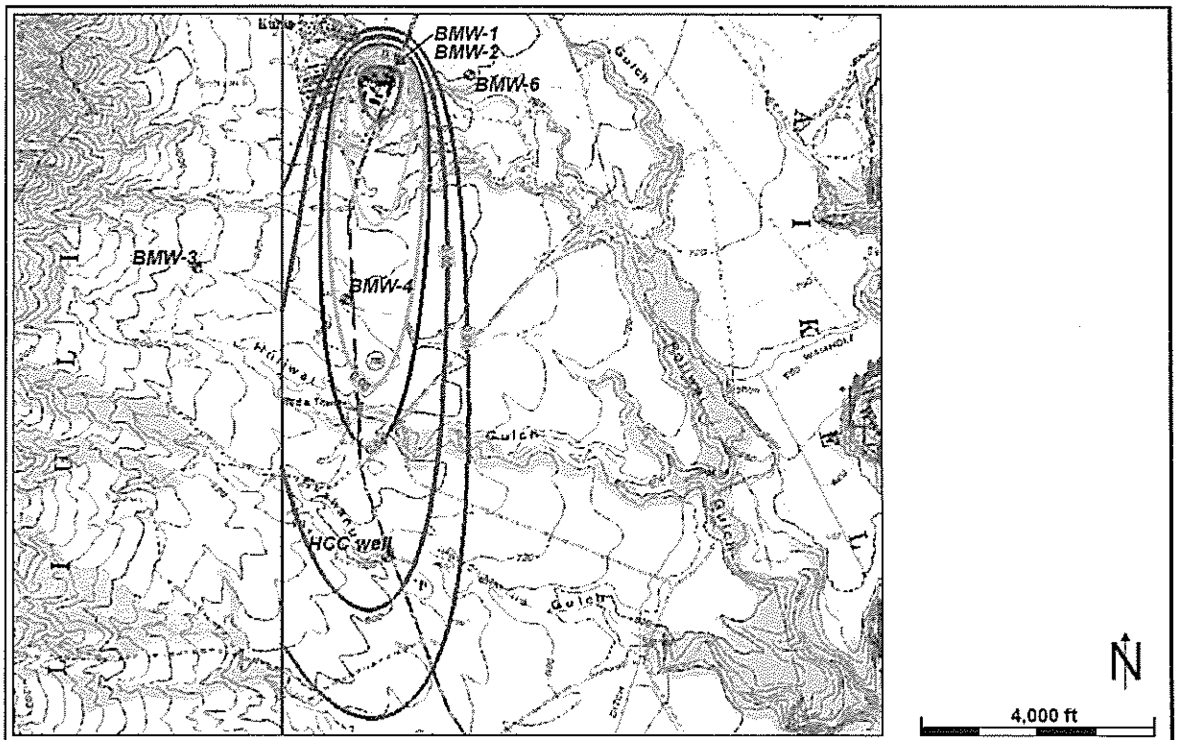


Figure 0-20: BMW-1 1997 to 2014, (Golder, 2014).



Golder Associates

TITLE Figure 1-7 - Simulated DBCP Plume – Plan View

Source: Evaluation of Background Concentrations of COCs in the Basal Aquifer - Del Monte Corporation, Hawaii (Golder 2009)

DRAWN SDT	DATE June 20, 2014	PROJECT No. 093-1532-002.0100	
CHECKED DJM	SCALE		
REVIEWED GZ			

Figure 0-21: Simulated DBCP Plume (Golder, 2014)

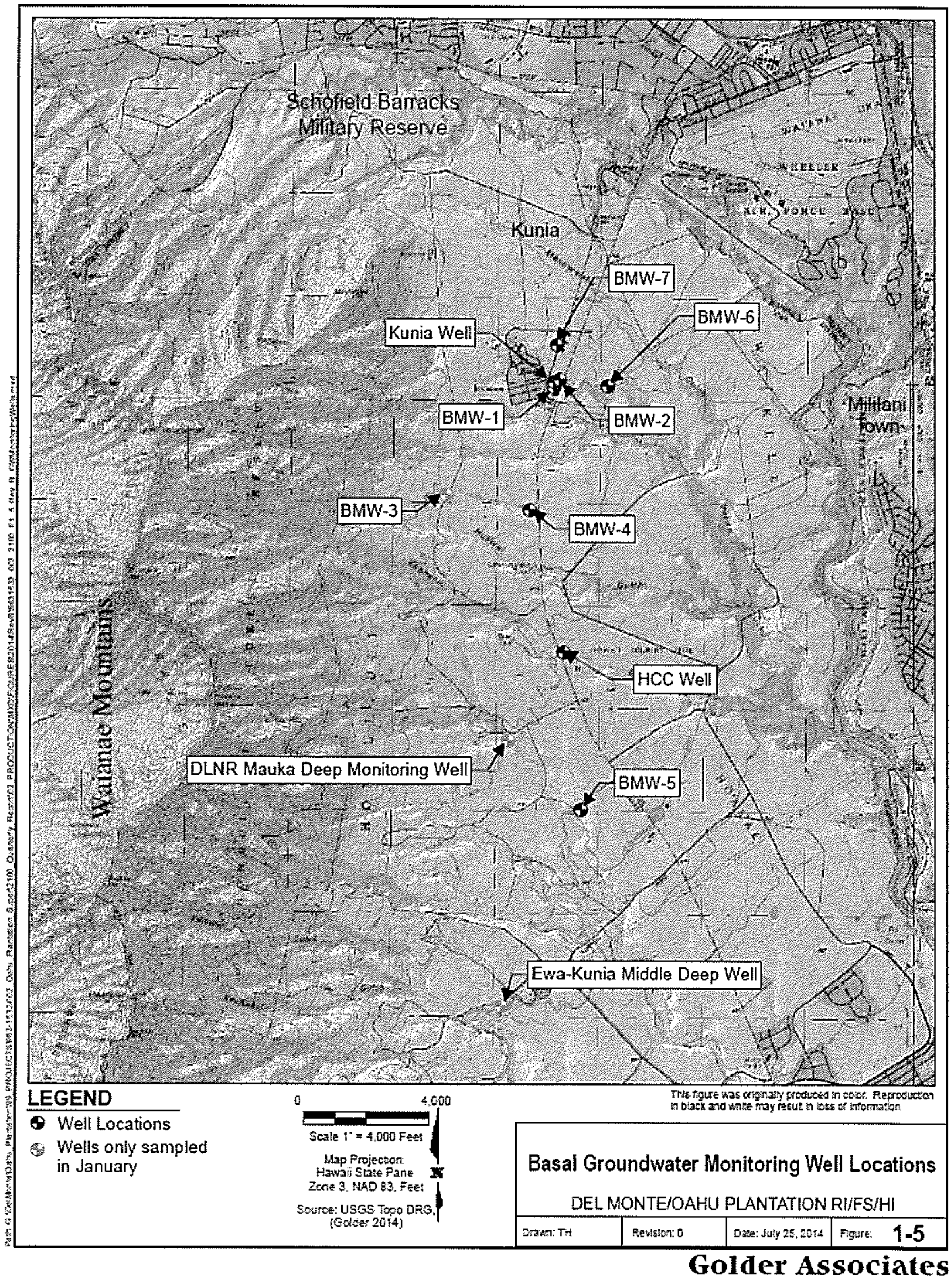


Figure 0-22: Basal Groundwater Monitoring Wells (Golder, 2014)

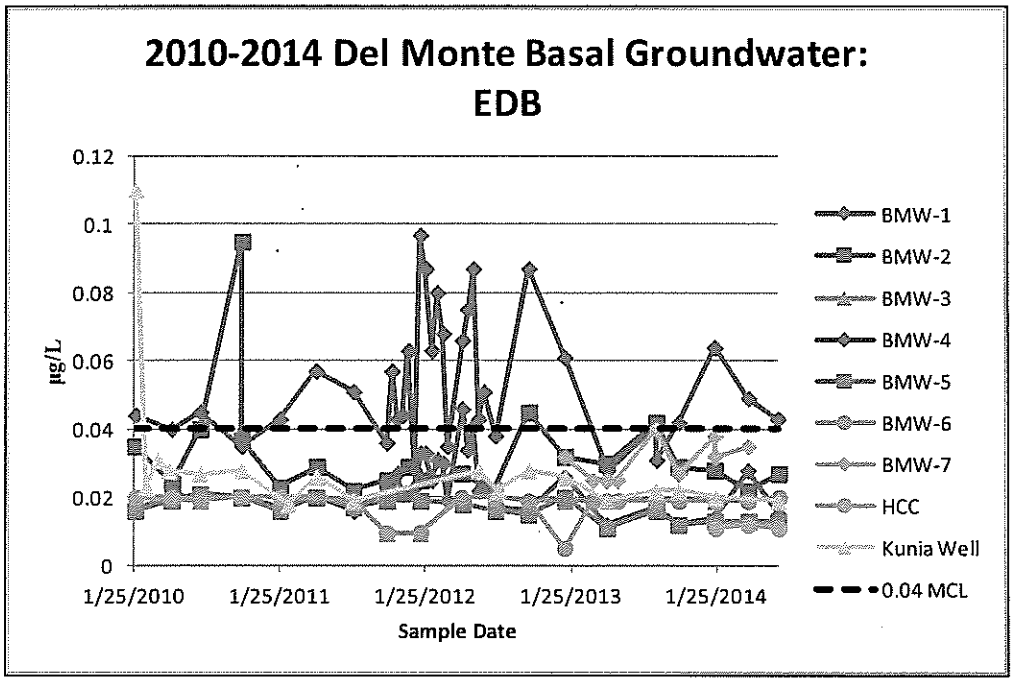


Figure 0-23: EDB Results for Basal Groundwater Jan. 2010-June 2014.

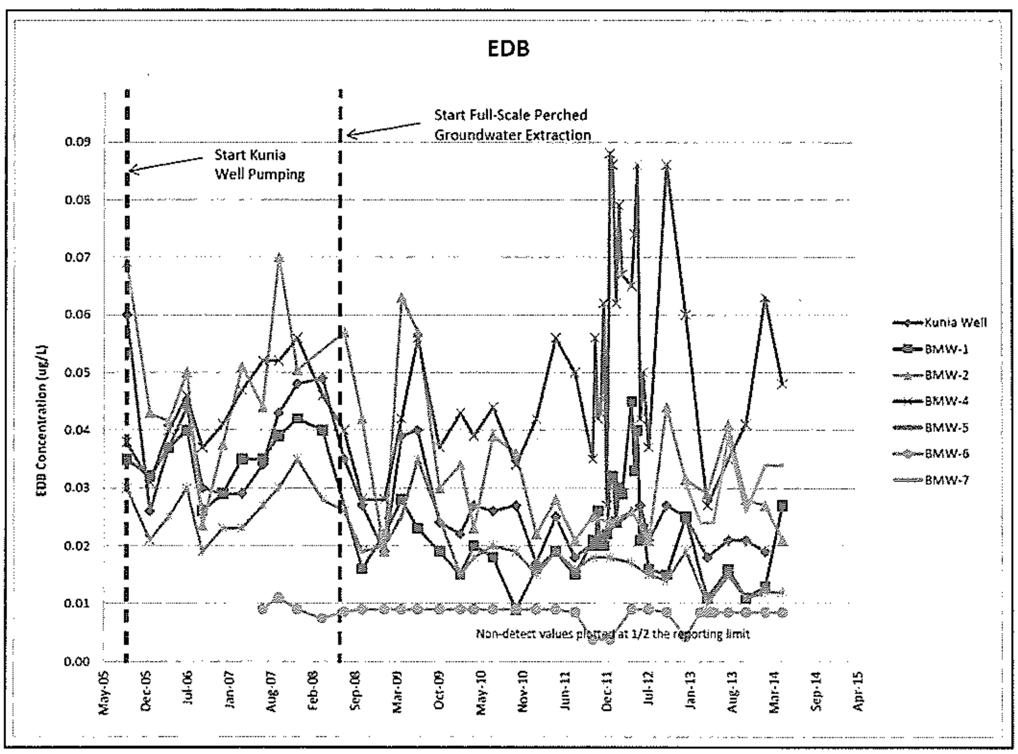


Figure 0-24: EDB Results for Basal Groundwater May 2005-April 2014 (Golder, 2014).

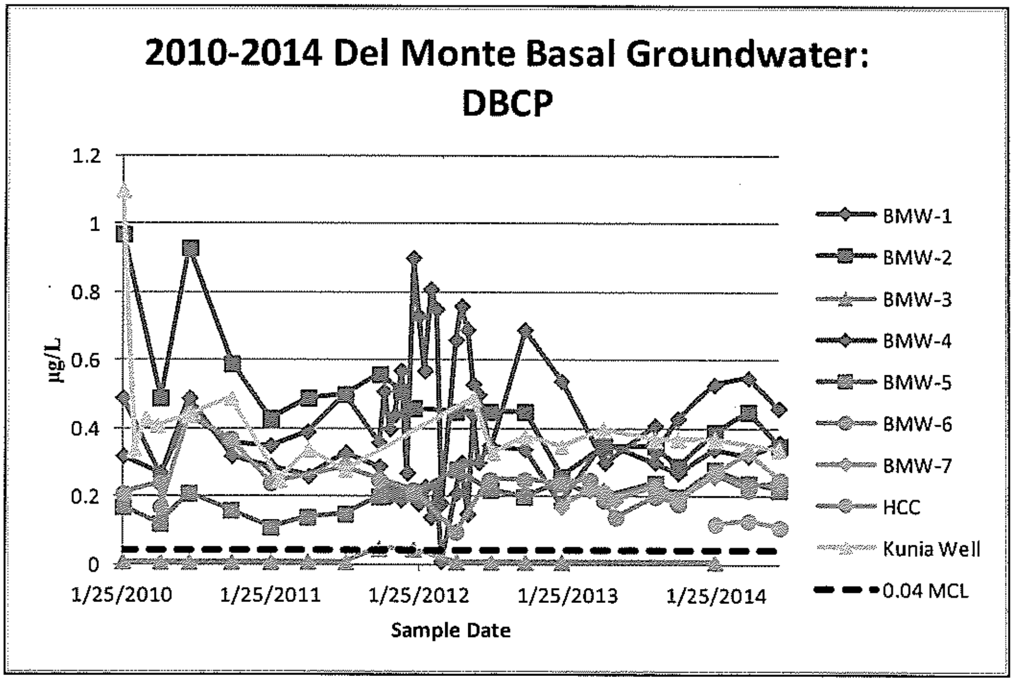


Figure 0-25: DBCP Results for Basal Groundwater Jan. 2010-June 2014

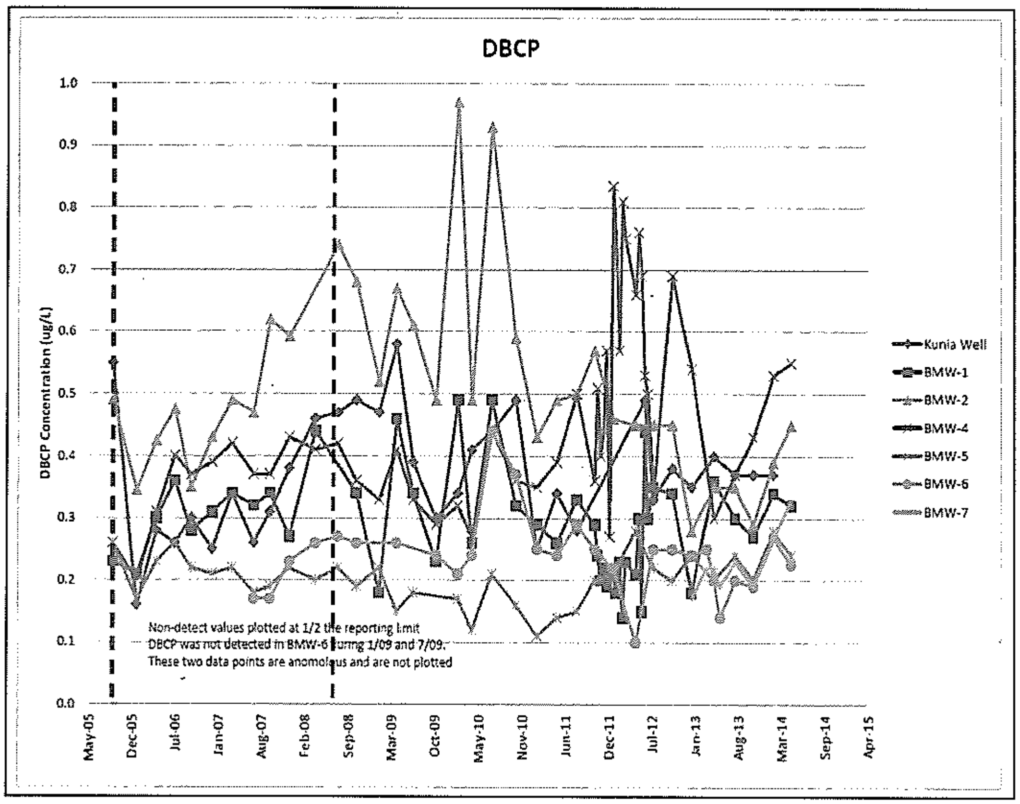


Figure 0-26: DBCP Results for Basal Groundwater May 2005 to April 2014 (Golder 2014).

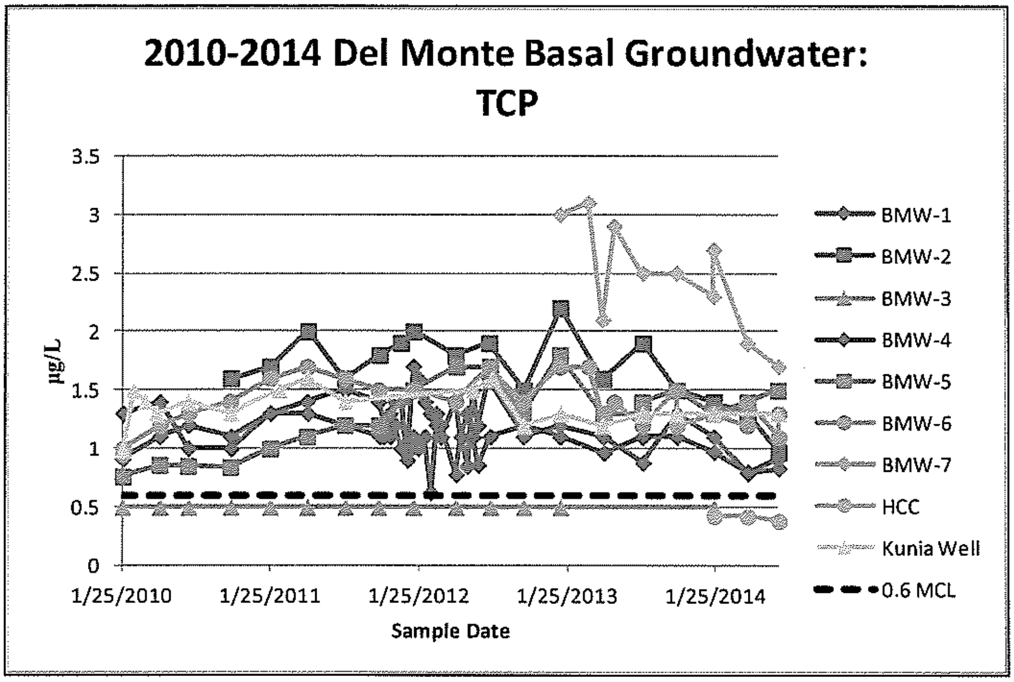


Figure 0-27: 1,2,3-TCP results for Basal Groundwater Jan. 2010 to June 2014.

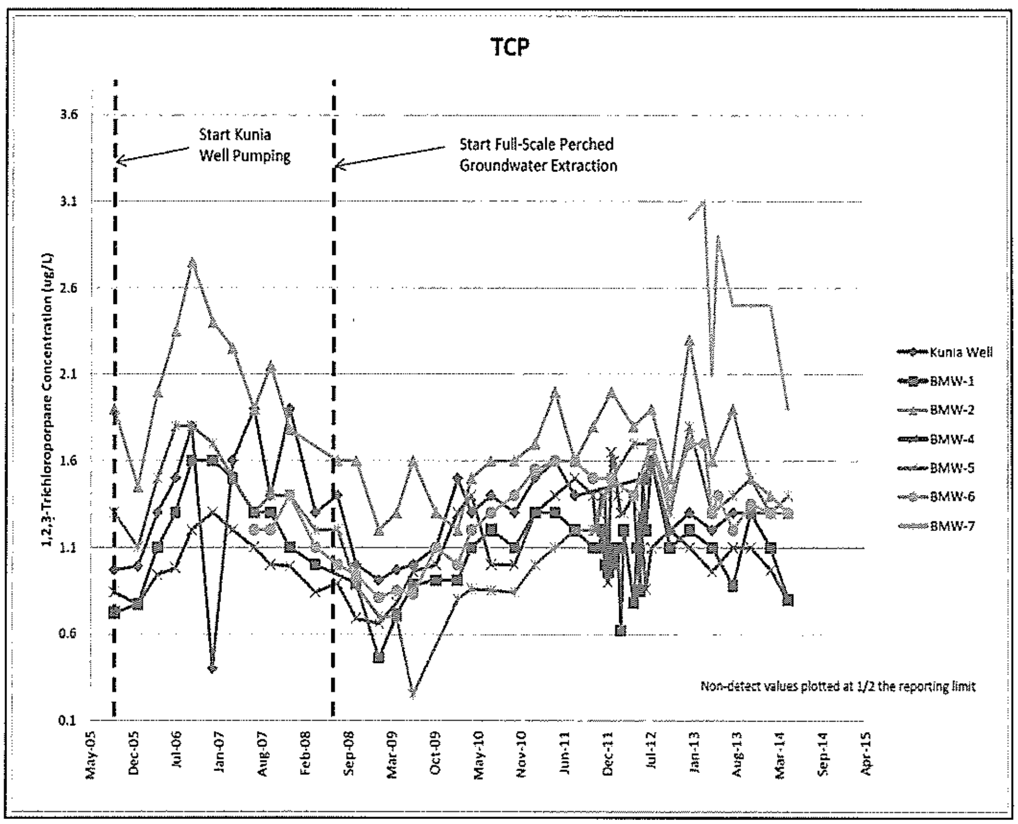


Figure 0-28: 1,2,3-TCP results for Basal Groundwater May 2005 to April 2014.

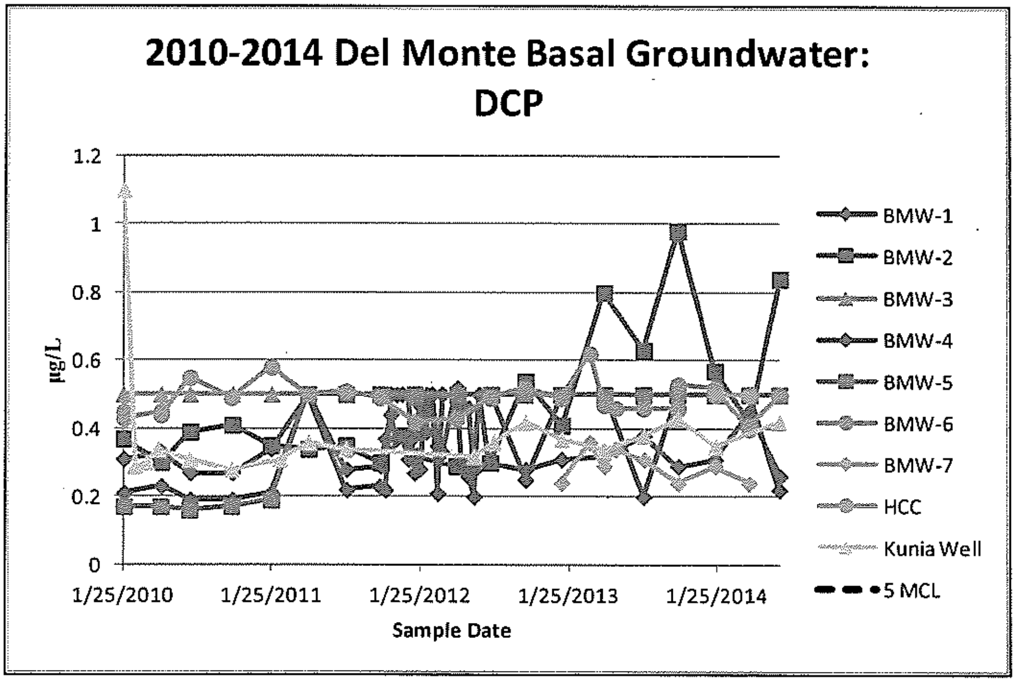


Figure 0-29: 1,2-DCP results for Basal Groundwater Jan. 2010 to June 2014.

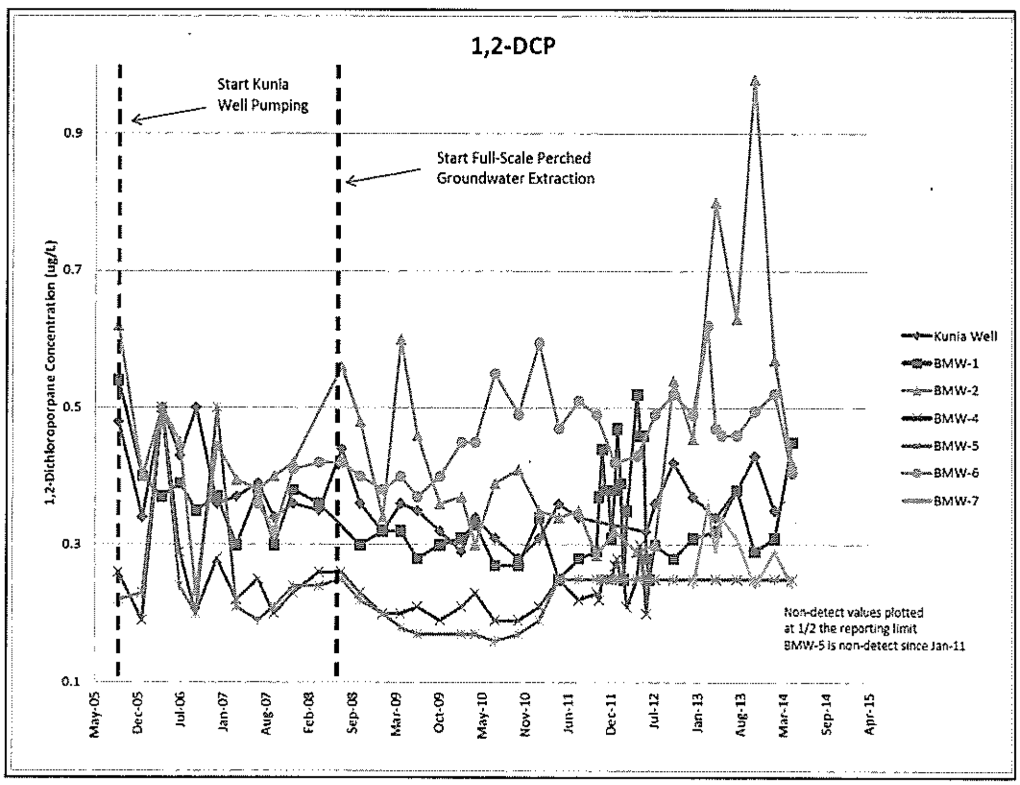


Figure 0-30: 1,2-DCP results for Basal Groundwater May 2005 to April 2014 (Golder 2014).

EDB

The EDB sampling results for the past five years included in this FYR are shown in Figure 0-23. The EDB results since the Kunia Well pumping began in September 2005 are shown on Figure 0-24. Between January 2010 and June 2014, BMW-2 and BMW-4 exceeded the MCL for EDB. BMW-7 and BMW-1 each had one sample at the MCL, but were otherwise below the MCL. BMW-5, the HCC well, and the Kunia Well had readings below the MCL. The first reading of the Kunia Well in January 2010 exceeded the MCL, but this reading appears to be due to incorrect sampling and Golder excluded that result. During this time period, BMW 3 and BMW 6 had undetected readings for every sample. Of the two wells that exceeded the MCL for more than one quarter, BMW 2 decreased to below the MCL, and the concentration was decreasing. BMW 4 readings vary from 0.04 to 0.1 µg/L (the highest reading for EDB in all monitoring wells), and the concentration over the past five years fluctuated without decreasing or increasing. During June 2014 sampling, only BMW-4 exceeded the MCL for EDB (Table 0-8).

DBCP

The DBCP sampling results for the past five years included in this FYR are shown on Figure 0-25. The DBCP results since the Kunia Well pumping began in September 2005 are shown on Figure 0-26. Between January 2010 and June 2014, only BMW 3 consistently had nondetects for DBCP, while all other wells were above the MCL for DBCP, including the two background wells BMW-6 and BMW-7. BMW 1 had a nondetect in March 2012. During June 2014 sampling, all wells except BMW-3 exceeded the MCL for DBCP (Table 0-8). All wells in the Waiawa-Waipahu aquifer system were above the MCL for DBCP, including the two background wells. The HCC well had the lowest concentration, and the two background wells BMW-6 and BMW-7 had the next lowest concentrations. The concentrations of DBCP have not decreased to below the MCL over the past five years. The concentration of DBCP increased once pumping of the Kunia Well began in 2005 and started decreasing and fluctuating once the perched groundwater extraction began in 2008, as shown in Figure 0-26.

1,2,3-TCP

The 1,2,3-TCP sampling results for the past five years included in this FYR are shown on Figure 0-27. The 1,2,3-TCP results since the Kunia Well pumping began in September 2005 are shown on Figure 0-28. Concentrations in all wells except for BMW-3 and the HCC well were above MCL for 1,2,3-TCP. BMW-3 had nondetects during each sampling event during the past five years. The background well BMW-7 had the highest level of 1,2,3-TCP, but the concentration has been decreasing since sampling began in 2013. BMW-1, BMW -2, and BMW-4, had slightly decreasing concentrations, and BMW-6 and the Kunia Well were not decreasing or increasing. BMW-5 has been increasing since 2010. During the June 2014 sampling, concentrations at BMW-1, BMW-2, BMW-4, BMW-5, BMW-6, BMW-7, and the Kunia Well all exceeded the MCL for 1,2,3-TCP (Table 0-8). Concentrations at BMW-1, BMW-2, BMW-4, BMW-5, BMW-6, BMW-7, and the Kunia Well (in the Waiawa-Waipahu aquifer system) were above the MCL for 1,2,3-TCP and are not decreasing to below the MCL.

1,2-DCP

The 1,2-DCP sampling results for the past five years included in this FYR are shown on Figure 0-29. The 1,2-DCP results since the Kunia Well pumping began in September 2005 are shown on Figure 0-30. All wells had concentrations below the MCL for 1,2-DCP. The nondetects are plotted at 0.5, which gives some wells the appearance of higher values in Figure 0-29. The two background wells, BMW-6 and BMW-7, detected 1,2-DCP in every sample, but the concentrations for both wells are not increasing. BMW-2 had an increasing concentration of 1,2-DCP, and in the last few years had 3 samples above 0.8 µg/L, which are the highest levels sampled for 1,2-DCP. The recent readings in BMW-3, BMW-4, and BMW-5 were nondetections. During the June 2014 reading, no wells exceeded the MCL for 1,2-DCP; all wells were below the MCL (Table 0-8).

Table 0-8: June 2014 Basal Groundwater Aquifer Sampling Results

Contaminant of Concern	EDB (µg/L) 0.04	DBCP (µg/L) 0.04	1,2,3-TCP (µg/L) 0.6	1,2-DCP (µg/L) 5
BMW-1 (6/30/14)	0.015	0.36	0.83	0.26
BMW-2 (6/30/14)	0.027	0.35	0.97	0.84
BMW-3 (1/21/14)	0.019 (U)	0.0096 (U)	0.5 (U)	0.5 (U)
BMW-4 (6/28/14)	0.043	0.46	0.91	0.22
BMW-5 (6/28/14)	0.013	0.22	1.5	0.5 (U)
BMW-6 (6/30/14)	0.02 (U)	0.25	1.3	0.5
BMW-7 (6/30/14)	0.029	0.25	1.7	0.26
HCC Well (6/30/14)	0.011	0.11	0.38	0.5 (U)
Kunia Well (6/28/14)	0.019	0.34	1.3	0.42

Note: Highlighted text indicates the sample exceeded the MCL.

Over the past five years most of the basal monitoring wells in the Waiawa-Waipahu aquifer did not exceed the MCLs for EDB and 1,2-DCP. BMW-4 exceeded the MCL for EDB. BMW-4 is downgradient of the Kunia Well. The EDB plume is modeled to have traveled only as far as BMW-4. The wells closest to the KVSA (Kunia Well, BMW-1 and BMW-2) had EDB concentrations near or below the MCL. The pump and treat system is working for EDB in the KVSA area. BMW-2 had some samples above the MCL during the past five years. It's possible that BMW-4 is related to background or the furthest extent of the EDB plume.

BMW-3 in the Ewa-Kunia aquifer had no detection of any COCs during any of the sampling events. Most wells in the Waiawa-Waipahu aquifer exceeded the MCLs for DBCP and 1,2,3-TCP, including the two background wells upgradient of the site (BMW-6 and BMW-7). The concentrations of DBCP and

1,2,3-TCP fluctuated and have not decreased below the MCL in the last five years. 1,2,3-TCP concentrations may be higher than the initial 1997 according to Figure 0-19 and Figure 0-20. Cleanup levels have not been achieved in these wells and the remedy is not performing as anticipated.

1.16. Site Inspection

A site inspection was completed on January 26, 2015. The EPA was the lead agency for the inspection and interviews. The interviews were held with the Golder project manager, two Second City employees, and the HDOH remedial project manager. Second City Property Management, Inc., is a subcontractor to Golder Associates, Del Monte's consultant, responsible for the day-to-day O&M of the remediation systems.

The site inspection indicates that the treatment facilities are being maintained in a manner that would allow them to continue to effectively remediate the contamination at the site. Note that the Waikakalaua Well is no longer being sampled since the construction of BMW-7. The Waikakalaua Fuel Storage Annex Well (ST12MW05) is located on Wheeler Air Force Base. The road to the well was washed out in 2008, so the only water level measurement during the last FYR period was in April 2012. Second City continues to include the HCC Well for monitoring purposes. It was noted that a trial shutdown of the treatment system was started in November 2014. The objective of the trial shutdown is to evaluate the potential for using Monitored Natural Attenuation (MNA) as a remedy for the site.

Similar to the observations made during the 2010 site visit, the basal and perched treatment systems, O&M activities, and documentation all appeared to be in order and in compliance with the O&M manuals and the Compliance Monitoring Plan. The O&M team appears to have the proper knowledge and skills to operate, maintain, and monitor the treatment system. The team was able to successfully effect repairs or replacement of critical components such as pumps and carbon adsorption media. They also displayed sufficient knowledge of waste disposal regulations which was important in the proper disposal of the spent granulated activated carbon media from the KWTS treatment tower. Based on this site visit, it is believed that the current operators of the treatment facility are able to preserve the current and long-term protectiveness of the remedy. No significant or unexpected issues were observed or discussed during the site visit.

1.17. Interviews

During the FYR process, interviews were conducted with parties impacted by the Site, including the current landowners and regulatory agencies involved in Site activities or aware of the Site. The purpose of the interviews was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy that have been implemented to date. All of the interviews were conducted during the Site visit on January26th, 2015. Interviews are summarized below and complete interviews are included in Appendix C.

Four interviews were conducted during the site visit. Interviewees included: Gary Zimmerman, Project Manager, Golder Associates; Eric Sadoyama, Remedial Project Manager, HDOH; Shane Lee, O&M

Manager, Second City Property Management; and Bonnie Gottlieb, Assistant to O&M Manager, Second City Property Management.

All stated that the project is going well, remedy is performing as expected. The Air Stripper is able to remove contaminants below drinking water levels, and the carbon desorption serves to "polish" the water to even lower levels. There have been some changes in O&M due to the trial shut down. Most importantly, the system is activated once a month to ensure that it still operates properly. Overall there have not been any been unexpected O&M difficulties or costs at the site in the last five years. One concern is the background levels in the basal aquifer which may prevent the remedy from achieving the RAOs.

1.18. Institutional Controls

A Record of Decision (ROD) was issued for the Site in September 2003 and institutional controls (ICs) were included as part of the selected remedy.

ICs in the form of land and/or water use restrictions, are an integral part of each of the components of the remedial action in order to prevent any exposure of the public to contaminants at the Site while cleanup levels have not been achieved, as well as to prevent interference with any aspect of the remedial action. ICs of access and deed restrictions were included as part of the two-part remedy. It should be noted that actual access controls such as fences and "No Trespassing" signage are considered physical controls and should be categorized as engineering controls. Therefore, the only true institutional controls from the ROD are the deed restrictions. A Consent Decree was lodged on June 8, 2007, that requires monitoring of ICs at the Site to verify that property owners and lessees have not undertaken any construction in the source area or the well restriction area that has damaged or interfered with basal groundwater monitoring or extraction wells. A summary of the Consent Decree is provided in Section 1.8.3.

During the site inspection performed on January 26, 2015, ICs related to Site access were observed to be in place.

The following table lists the ICs associated with the Site.

Table 0-9. IC Summary Table

Media	ICs Called for in the Decision Documents	IC Objective	Instrument in Place
Soil, Perched Groundwater in Source Area	Yes	Restricting land use to prevent exposure and to prevent activities that might interfere with the effectiveness of the remedy.	There is a Consent Decree that requires monitoring of ICs at the site.

Media	ICs Called for in the Decision Documents	IC Objective	Instrument in Place
Basal Aquifer Groundwater in Well Restriction Area	Yes	Restricting land use to prevent exposure to basal groundwater impacted by COCs and to prevent activities that might interfere with the effectiveness of the remedy.	There is a Consent Decree that requires monitoring of ICs at the site.

To verify that the owners are in compliance with Consent Decree a review is performed monthly of the State of Hawaii Department of Land and Natural Resources Water Commission Monthly Reports and a site inspection is performed annually.

The most recent Institutional Controls report (ARCADIS 2014) concluded the following:

- Affected lessees and landowners certified compliance with the Consent Decree;
- No permits for water use in restricted areas have been requested of the DLNR's Water Commission;
- An inspection of the Source Area, the Phytoremediation Area and basal monitoring wells confirmed that the remediation system is intact and operational; and
- No construction or other activities have interfered with the functioning of the basal monitoring wells.

The previous annual reports for 2010 through 2013 also concluded that Institutional Controls were in place and the requirements were in compliance.

Technical Assessment

1.19. Question A: Is the remedy Functioning as Intended by the Decision Documents?

Yes, the remedy is mostly functioning as intended by the Record of Decision (ROD).

Based on the site inspection, as well as data and document reviews, it appears that the two parts of the Site remedy (the Basal Aquifer Remedy and the Perched Aquifer and Deep Soil Remedy), including institutional control (IC) components, are currently functioning as intended by the ROD, although cleanup levels and Remedial Action Objectives (RAOs) have not yet been achieved.

The remedy for the perched aquifer consists of groundwater extraction and treatment as well as a vegetated cover and storm water controls to effect perched groundwater source control and inhibit infiltration of perched groundwater to the basal aquifer. This is augmented with soil vapor extraction (SVE) to address deeper soil contamination. There is also an IC component to restrict land use in order to prevent damage to the vegetated cover, or cap. Perched groundwater is being treated at both the Kunia Well Treatment System (KWTS) and the phytoremediation system. Soil vapor is treated with carbon and discharged to the air. Perched aquifer monitoring data indicate that the groundwater extraction system of the perched aquifer is effective at removing water from the area. During the past five years of cumulative mass removal, the SVE system was effective at removing 1,2-DCP, and removed 210 percent of the initial mass estimate. The system was less effective at removing DBCP and EDB from the perched aquifer, only removing 10 percent of DBCP and 4.5 percent of EDB. All three constituents of concern (COCs) have reached asymptotic concentration levels, but DBCP and EDB have not met performance standards of 95 percent and 75 percent reduction.

The remedy for the basal aquifer consists of basal groundwater extraction and treatment from the Kunia Well to effect plume capture and source control. Basal aquifer monitoring data indicate that COC concentrations have decreased in the Kunia Well and the source area is contained. COC concentrations exceed the EDB maximum contaminant level (MCL) for only one basal monitoring well. MCLs for DBCP and 1,2,3-TCP are exceeded in most of the wells in the Waiawa-Waipahu aquifer, including in the Kunia Well and in the upgradient background wells. COC concentrations in downgradient monitoring wells and upgradient monitoring wells are higher than the MCL due to elevated background concentrations.

The perched and basal groundwater monitoring and SVE well network, KWTS, and SVE system continue to be monitored monthly and quarterly, and reports are prepared on a quarterly basis.

1.20. Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of Remedy Selection Still Valid?

Yes. A review of the existing Applicable or Relevant and Appropriate Requirements (ARARs) indicates that there have been no significant changes or updates that would impact the short-term protectiveness of the remedy. The remedy may not be meeting the RAO that requires restoring the basal groundwater to its beneficial use of drinking water supply within a reasonable timeframe (aquifer restoration).

An additional exposure pathway that was not addressed in the Baseline Risk Assessment (BRA) is volatile organic compound (VOC) vapors migrating from impacted soil or groundwater to indoor air inside buildings. Target groundwater concentrations were developed and screening levels were calculated using a target risk of 1×10^{-6} for chemicals with carcinogenic health effects and a target hazard quotient of 1 for chemicals with noncarcinogenic health effects. The Hawaii MCLs are lower than the vapor intrusion screening levels for two of the four COCs (EDB and 1,2,3-TCP), but for DBCP and 1,2-DCP, the vapor intrusion screening level is less than the MCL. To determine the protectiveness of the MCL for DBCP and 1,2-DCP for the vapor intrusion pathway, the risk of exposure through inhalation of vapors from 1,2-DCP in groundwater was computed. It was determined that cleaning up the groundwater to Hawaii MCLs will be protective of potential future residents exposed to COCs in groundwater through vapor intrusion. Also, currently, there are no buildings within 100 ft laterally and/or vertically of contamination in the perched or basal aquifer. Therefore, there is no current risk from the vapor intrusion pathway.

There have been a number of changes to the toxicity values for specific COCs in soil and groundwater at the Site since the ROD was completed in 2003. The Regional Screening Levels (RSLs) for cancer risk in excess of 1×10^{-6} for two of the four COCs (DBCP and 1,2,3-TCP) are lower than the MCLs and may affect future protectiveness if the basal aquifer is used for domestic water.

The RAOs incorporated Hawaii MCLs as the cleanup levels in the basal aquifer for groundwater contamination at the Site. The Hawaii MCLs for the COCs have not changed since the ROD was issued so the cleanup levels are current. However, due to background concentrations of COCs in basal groundwater above Hawaii MCLs, it does not currently appear that reducing basal groundwater COC concentrations to less than Hawaii MCLs, as indicated in the 2003 ROD, is feasible.

The qualitative screening ecological risk assessment concluded that there were no realistic exposure pathways for ecological receptors and no unacceptable risk. Because Site conditions have not changed since completion of the BRA, the conclusion that there are no exposure pathways for ecological receptors is still valid, and no unacceptable risk is attributable to the Kunia Village Source Area (KVSA).

1.21. Question C: Has Any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

No. There has not been any new information that would call into question the protectiveness of the remedy.

1.22. Technical Assessment Summary

Based on the data and documents reviewed, ICs, site inspections, and the interviews, the remedy for the Del Monte Site is mostly functioning as intended by the ROD. The remedy may not meet the RAO that requires restoring the basal groundwater to its beneficial use of drinking water supply within a reasonable timeframe (aquifer restoration), because background concentrations for EDB, DBCP, and 1,2,3-TCP are above the MCLs for these COCs. SVE in the perched aquifer and deep soil is not removing mass as expected in the ROD.

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy, and no changes to the ARARs have been identified that would affect the protectiveness of the remedy. There have been minor changes in toxicity factors for the COCs, but do not impact the RAOs or the protectiveness of the remedy since the remedy is based on State of Hawaii MCLs.

Issues

Table 0-1 provides issues identified during this FYR at the Del Monte Corporation (Oahu Plantation) Superfund Site (Site):

Table 0-1. Current Issues for the Site

Issue	Affects Current Protectiveness (Yes or No)	Affects Future Protectiveness (Yes or No)
The Remedial Action Objective that requires restoring the basal groundwater to its beneficial use of drinking water supply within a reasonable timeframe cannot be met because background concentrations of EDB, DBCP, and 1,2,3-TCP are above MCLs.	No	Yes
SVE mass removal is not as expected in the ROD.	No	Yes
The toxicity of 1,2,3-TCP and DBCP has become more stringent, and as a consequence, the cleanup levels selected in the ROD are above EPA's protective risk range.	No	Yes
Potential vapor intrusion pathway from vadose zone contamination has not been assessed for future residential use.	No	Yes

Recommendations and Follow-up Actions

Table 0-1 provides recommendations to address the current issues at the Del Monte Corporation (Oahu Plantation) Superfund Site (Site).

Table 0-1. Recommendations to Address Current Issues at the Site

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Yes or No)	
					Current	Future
The Remedial Action Objective (RAO) that requires restoring the basal groundwater to its beneficial use of drinking water supply within a reasonable timeframe cannot be met because background concentrations of EDB, DBCP, and 1,2,3-TCP are above MCLs.	Evaluate the impact of background concentrations on current RAOs.	Potentially Responsible Party	EPA	11/2016	No	Yes
SVE mass removal is not as expected in the ROD.	The perched aquifer remediation timeframe, the effectiveness of SVE mass removal, and the percent reduction performance criteria should be evaluated.	Potentially Responsible Party	EPA	11/2016	No	Yes
The toxicity of 1,2,3-TCP and DBCP has become more stringent, and as a consequence, the cleanup levels selected in the ROD are above EPA's protective risk range.	Re-evaluate cleanup levels once background levels are established					
Potential vapor intrusion pathway from vadose zone contamination has not been assess for future residential use.	Re-evaluate as remedy progresses and if ICs are lifted.					

Protectiveness Statement

The remedy at Del Monte Corporation (Oahu Plantation) Superfund Site currently protects human health and the environment because there is no complete exposure route to untreated perched or basal aquifer groundwater and there are institutional controls included in the deed restrictions to prevent exposure until the groundwater meets the MCLs. However, in order for the remedy to be protective in the long-term, an evaluation of the impact of background concentrations on current RAOs should be performed, the perched aquifer and SVE performance criteria should be evaluated in the context of future vapor intrusion from the vadose zone, and the cleanup levels of 1,2,3-TCP and DBCP should be re-evaluated.

Next Review

This Site that requires ongoing FYRs as long as waste is left on site that does not allow for unlimited use and unrestricted exposure. The next FYR will be due within five years of the signature date of this FYR.

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Appendix A: List of Documents Reviewed

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List of Documents Reviewed

ARCADIS. 2010. *2010 Institutional Controls Annual Report Del Monte Pineapple Plantation Superfund Site Kunia, Oahu, Hawaii.* September 17, 2010.

ARCADIS. 2011. *2011 Institutional Controls Annual Report Del Monte Pineapple Plantation Superfund Site Kunia, Oahu, Hawaii.* September 19, 2011.

ARCADIS. 2012. *2012 Institutional Controls Annual Report Del Monte Pineapple Plantation Superfund Site Kunia, Oahu, Hawaii.* September 12, 2012.

ARCADIS. 2013. *2013 Institutional Controls Annual Report Del Monte Pineapple Plantation Superfund Site Kunia, Oahu, Hawaii.* September 11, 2013.

ARCADIS. 2014. *2014 Institutional Controls Annual Report Del Monte Pineapple Plantation Superfund Site Kunia, Oahu, Hawaii.* September 17, 2014.

EPA (U.S. Environmental Protection Agency). 2003. *Record of Decision – Del Monte Corporation Oahu Plantation Superfund Site – Kunia, Hawaii.* Region IX – San Francisco, California. September.

EPA. 2008. *Preliminary Close Out Report, Del Monte Corporation Oahu Plantation Superfund Site, Kunia, Hawaii.* September 8.

EPA. 2010. *First Five Year Review Report for Del Monte Corporation (Oahu Plantation) Superfund Site, Kunia, Hawaii.* June 14.

EPA. 2012. *Vapor Intrusion Screening Level (VISL) Calculator, User's Guide.* Currently available online at: http://www.epa.gov/oswer/vaporintrusion/guidance.html

EPA. 2013. OSWER Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air (External Review Draft). April 2013.

Golder Associates. 2014. *October 2013 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. March 24.

Golder Associates. 2014. *Fourth Quarter 2013 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. March 27.

Golder Associates. 2014. *January 2014 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. April 4.

Golder Associates. 2014. *First Quarter 2014 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. April 14.

Golder Associates. 2014. *Background Concentrations of Chemicals of Concern in the Basal Aquifer.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. May 15.

Golder Associates. 2014. *Evaluation of Monitored Natural Attenuation Remedial Alternative for the Basal Aquifer*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. July 2.

Golder Associates. 2014. *Second Quarter 2014 Perched Groundwater Remedial Action Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. July 25.

Golder Associates. 2014. *April 2014 Quarterly Basal Groundwater Monitoring Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. July 31.

Golder Associates. 2014. *Proposal for a Trial Shutdown of the Kunia Well Basal Groundwater Extraction and Treatment System*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. October 16.

Golder Associates. 2013. *October 2012 Quarterly Basal Groundwater Monitoring Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. January 24.

Golder Associates. 2013. *Fourth Quarter 2012 Perched Groundwater Remedial Action Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. February 20.

Golder Associates. 2013. *First Quarter 2013 Perched Groundwater Remedial Action Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. May 8.

Golder Associates. 2013. *January 2013 Quarterly Basal Groundwater Monitoring Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. May 10.

Golder Associates. 2013. *April 2013 Quarterly Basal Groundwater Monitoring Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. August 14.

Golder Associates. 2013. *Second Quarter 2013 Perched Groundwater Remedial Action Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. August 20.

Golder Associates. 2013. *July 2013 Quarterly Basal Groundwater Monitoring Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. November 13.

Golder Associates. 2013. *Third Quarter 2013 Perched Groundwater Remedial Action Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. November 20.

Golder Associates. 2012. *Fourth Quarter 2011 Perched Groundwater Remedial Action Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. February 17.

Golder Associates. 2012. *October 2011 Quarterly Basal Groundwater Monitoring Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. February 17.

Golder Associates. 2012. *January 2012 Quarterly Basal Groundwater Monitoring Report*. Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. May 4.

Golder Associates. 2012. *First Quarter 2012 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. May 11.

Golder Associates. 2012. *April 2012 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. August 13.

Golder Associates. 2012. *Second Quarter 2012 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. August 20.

Golder Associates. 2012. *Third Quarter 2012 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. November 8.

Golder Associates. 2012. *July 2012 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. November 15.

Golder Associates. 2011. *October 2010 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. January 13.

Golder Associates. 2011. *Fourth Quarter 2010 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. January 21.

Golder Associates. 2011. *January 2011 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. April 27.

Golder Associates. 2011. *First Quarter 2011 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. May 4.

Golder Associates. 2011. *April 2011 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. July 21.

Golder Associates. 2011. *Second Quarter 2011 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. August 1.

Golder Associates. 2011. *Third Quarter 2011 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. November 28.

Golder Associates. 2011. *July 2011 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. November 29.

Golder Associates. 2010. *First Quarter 2010 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. April 14.

Golder Associates. 2010. *January 2010 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. April 19.

Golder Associates. 2010. *April 2010 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. June 30.

Golder Associates. 2010. *Second Quarter 2010 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. July 6.

Golder Associates. 2010. *July 2010 Quarterly Basal Groundwater Monitoring Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. September 30.

Golder Associates. 2010. *Third Quarter 2010 Perched Groundwater Remedial Action Report.* Del Monte Corporation (Oahu Plantation) Superfund Site. Kunia, HI. October 14.

Appendix B: Press Notices

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PUBLIC NOTICE
The Second Five-Year Review of the Cleanup at the
Del Monte Oahu
Superfund Site Begins

The United States Environmental Protection Agency (EPA) began the Second Five-Year Review (FYR) for the Del Monte Superfund Site (Site) located in Kunia, Oahu, HI. The EPA is the lead agency overseeing the [illegible] at the Site. The primary purpose of this review is to confirm that cleanup actions at the Site continue to be protective of human health and the environment.

The Review Process

The EPA conducts FYRs when hazardous substances remain on site that prevent unrestricted use and exposure. The EPA will review how well the remedy is achieving the Site's cleanup goals, changes in scientific knowledge about site contaminants, changes in [illegible], and changes in regulations. One previous review was completed at the Site in 2010.

Site History

The Site is a former 6,000-acre pineapple plantation located on the north-central plateau of Oahu. Del Monte Fresh Produce (Hawaii) Inc. (Del Monte) grew and processed pineapple at the plantation from about 1946 to November 2006. During that time, a number of pesticides (soil fumigants) were applied to the soil to control nematodes (worms) that attack pineapple roots. These fumigants were stored, mixed, and spilled in an area near the Kunia Well, a former drinking water supply well. Fumigants spilled in the area have contaminated soils (20 feet to 100 feet below ground surface), [illegible] and perched groundwater, as well as deep basal groundwater ([illegible] feet). Constituents of concern (COCs) in soil and groundwater are ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP), 1,2-dichloropropane (1,2-DCP), and 1,2,3-trichloropropane (1,2,3-TCP). [illegible], DBCP, and 1,2-DCP [illegible] the basal groundwater at the Site, and that a substantial threat of release to basal groundwater exists. The Site was added to the National Priorities List on December 16, 1994. In 2003, EPA selected a two-part remedy for the contaminated aquifers and deep soils.

Get Involved

If you have any concerns about the Site, the EPA would like to talk with you. To schedule an interview, contact [illegible], Remedial Project Manager at (415) 972-3149 or by email at [illegible] by June 16, 2015. The Five-Year Review report is scheduled to be completed by September 30, 2015 and will be available online shortly after this date at [illegible]/Del Monte, and at the Site's repository at the Wahiawa Public Library, 820 California Avenue, Wahiawa, HI 96786, (808) 622-6345.

dersea cables.

The Wednesday meeting will be used to look into the proposal and discuss environmental studies in Hawaii, as well as community concerns and BOEM's intent to understand whether other companies are interested in the area, said Joan Barminski, regional supervisor of the Office of Strategic Resources BOEM Pacific Region.

ALPHA WIND'S request to BOEM is the earliest step in a process, said BOEM spokesman John Romero. The review includes an environmental analysis as well as stakeholder and community engagement.

"This is very early in the process. Nothing has been permitted," Romero said. "There are a lot of hoops that have to be met."

The top of the turbines stand roughly 600 feet above their floating foundations, said Doug Boren, chief of the Renewable Energy section of BOEM Pacific Region.

"(They are) roughly the height of the Space Needle in Seattle," Boren said.

Henry Curtis, executive director of Life of the Land, said some concerns include residents' ability to see the turbines from the shore and

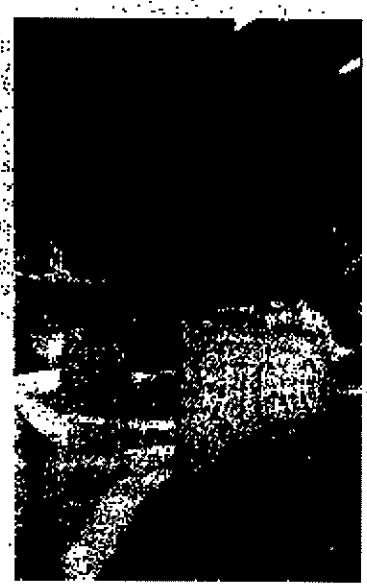
MEETING TIME

The U.S. Bureau of Ocean Energy Management will present information on wind energy projects off Oahu and will explain the next steps in the process.

» When: Wednes[day]
5 to 9 p.m.;
Registration
5:10 p.m. to 2:[illegible]
[illegible] Program.
Public Q&A beg[ins]
5 minutes after
meeting adjourn[s]
» Where: Homer
Maxey Internat[ional]
Trade Resource
Center, Pier 2, 5[illegible]
Ala Moana Blvd

It's a "positive if the [proj]ect is regarded as a la[nd]mark and visual proo[f] Oahu is clean and gre[en]," the company said in i[ts] lease application. "It i[s] likely the project will [be]come a tourist attract[ion] where tour boats will [take] tourists past the proj[ect to] show the size and aw[e of the] project."

Another concern w[ould] be the noise affecting [ma]rine mammals' comm[unication]



HONOLULU STAR - ADVERTISER
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Appendix C: Interview Forms

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Interview Forms

Five-Year Review Interview Record			
Site: Del Monte Corporation Superfund Site		**EPA ID No:**	HID980637631

Interview Type: Visit
Location of Visit: Kunia Village, Oahu, Hawaii
Date: January 26, 2015
Time: 2:00 pm

Interviewers

Name	Title	Organization
Christopher Lichens	Remedial Project Manager	US EPA, Region 9

Interviewees

Name	Organization	Title	Telephone	Email
Gary Zimmerman	Golder Associates	Project Manager	425-883-0777	Gary_Zimmerman@golder.com
			425-753-4903	

Summary of Conversation

1) What is your overall impression of the project? Overall, project is going great.

2) Is the remedy functioning as expected? YES, Air stripper and carbon desorption working well. Entering two-year trial shutdown earlier than expected.
How well is the remedy performing? Air stripper is able to remove contaminants below drinking water levels, carbon desorption serves to "polish" the water to even lower levels.
Have there been any changes to the implementation of the remedy? NO.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Data shows decreasing contaminant levels for basal and perched water. The only exception noted was that for BMW-4, where it may be affected by elevated background levels.

4) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. YES, there is a continuous O&M presence. On-site personnel consists of Shane Lee (O&M Supervisor) and Bonnie Gottlieb (Assistant to O&M Supervisor). These personnel are responsible for the maintenance and daily measurements of the system. Shane Lee continues to report to Gary Zimmerman on a regular basis.

5) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts. NO. Only change noted was the trial shutdown.

6) What are the annual operating costs for your organization's involvement with the site? Data to be sent to Chris Lichens and Mark Arakaki via email. Once received, costs will be entered in the site inspection checklist.

7) Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details. NO.

8) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. NO.

9) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy? NO.

10) Do you have any comments, suggestions, or recommendations regarding the project? NO.

Additional Site-Specific Questions
1) Have there been any recent issues with the pump and treat system and SVE system? NO.
2) Has an Annual Institutional Controls Report been completed in the last five years. Chris indicated that a hard copy of the latest report was sent to the Seattle District and they should be receiving it soon.

Five-Year Review Interview Record			
Site: Del Monte Corporation Superfund Site		**EPA ID No:**	HID980637631

Interview Type: Visit
Location of Visit: Kunia Village, Oahu, Hawaii
Date: January 26, 2015
Time: 2:20 pm

Interviewers

Name	Title	Organization
Christopher Lichens	Remedial Project Manager	US EPA, Region 9

Interviewees

Name	Organization	Title	Telephone	Email
Eric Sadoyama	Hawaii DOH	Remedial Project Manager	808-586-4249	eric.sadoyama@hawaii.doh.gov

Summary of Conversation

1) What is your overall impression of the project? Project is going smoothly. Only concern was background levels in the basal aquifer.

2) Is the remedy functioning as expected? YES, it is functioning as expected.
How well is the remedy performing? No comment.
Have there been any changes to the implementation of the remedy? No comment.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? No comment on monitoring data.

4) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. This question was skipped.

5) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts. This question was skipped.

6) What are the annual operating costs for your organization's involvement with the site? This question was skipped.

7) Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details. This question was skipped.

8) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. This question was skipped.

9) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy? NO. However Eric expressed his concern with the relationship between CERCLA and FIFRA, specifically the issue of legally applied pesticides. He believes that his program should have increased regulatory authority over sites with residual pesticide contamination where a land use change has occurred.

10) Do you have any comments, suggestions, or recommendations regarding the project? Eric reiterated his opinion that the treatment at the site is running smoothly.

Additional Site-Specific Questions

[If needed]

Five-Year Review Interview Record			
Site: Del Monte Corporation Superfund Site		**EPA ID No:**	HID980637631

Interview Type: Visit
Location of Visit: Kunia Village, Oahu, Hawaii
Date: January 26, 2015
Time: 2:40 pm

Interviewers

Name	Title	Organization
Christopher Lichens	Remedial Project Manager	US EPA, Region 9

Interviewees

Name	Organization	Title	Telephone	Email
Shane Lee	Second City Property Management	O&M Manager	808-674-9996	
			808-330-4399	

Summary of Conversation

1) What is your overall impression of the project? Shane stated that the project seems to be working.

2) Is the remedy functioning as expected? This question was skipped.
How well is the remedy performing? This question was skipped.
Have there been any changes to the implementation of the remedy This question was skipped.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? This question was skipped.

4) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. This question was skipped.

5) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts. Shane mentioned that the trial shutdown would pose different maintenance requirements. Two examples cited were keeping the carbon adsorption medium wet and monitoring the treatment systems for algae growth.

6) What are the annual operating costs for your organization's involvement with the site? This question was skipped.

7) Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details. This question was skipped.

8) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. This question was skipped.

9) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy? This question was skipped.

10) Do you have any comments, suggestions, or recommendations regarding the project? Shane did not have any further comments on the project.

Additional Site-Specific Questions

[If needed]

Five-Year Review Interview Record			
Site: Del Monte Corporation Superfund Site		**EPA ID No:**	HID980637631

Interview Type: Visit
Location of Visit: Kunia Village, Oahu, Hawaii
Date: January 26, 2015
Time: 2:30 pm

Interviewers

Name	Title	Organization
Christopher Lichens	Remedial Project Manager	US EPA, Region 9

Interviewees

Name	Organization	Title	Telephone	Email
Bonnie Gottlieb	Second City Property Management	Assistant to O&M Mgr	808-674-9996	

Summary of Conversation

1) What is your overall impression of the project? Bonnie stated that the project is going good.

2) Is the remedy functioning as expected? Bonnie stated that she believes the remedy is functioning as expected.
How well is the remedy performing? No comment.
Have there been any changes to the implementation of the remedy? No comment.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? This question was skipped.

4) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. This question was skipped.

5) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts. Bonnie mentioned that the scheduling for the manifold system has changed due to the trial shutdown.

6) What are the annual operating costs for your organization's involvement with the site? This question was skipped.

7) Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details. This question was skipped.

8) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. This question was skipped.

9) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy? This question was skipped.

10) Do you have any comments, suggestions, or recommendations regarding the project? Bonnie did not have any further comments on the project.

Additional Site-Specific Questions

[If needed]

Appendix D: Site Inspection Checklist

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Site Inspection Checklist

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Del Monte Corp (Oahu Plantation) Superfund	**Date of inspection:** January 26, 2015
Location: Kunia/Honolulu, Hawaii	**EPA ID:** HID980637631
Agency, office, or company leading the five-year review: U.S. EPA Region IX	**Weather/temperature** Slight Breeze, Partly Cloudy, 78°F
Remedy Includes: (Check all that apply) ■ Landfill cover/containment ■ Access controls ■ Institutional controls ■ Groundwater pump and treatment ☐ Surface water collection and treatment ■ Other: Phytoremediation, soil vapor extraction system, groundwater monitoring	■ Monitored natural attenuation ■ Groundwater containment ☐ Vertical barrier walls
Attachments: ■ Inspection-team roster attached	☐ Site map attached
II. INTERVIEWS (Check all that apply)	
1. **O&M site manager** Gary Zimmerman (Name), Project Manager (Title), Jan. 26, 2015 (Date) Interviewed ■ at site ☐ at office ☐ by phone Phone no. 425-753-4903 Problems, suggestions; ■ Report attached	
2. **O&M staff** Shane Lee (Name), O&M Supervisor (Title), Jan. 26, 2015 (Date) Interviewed ■ at site ☐ at office ☐ by phone Phone no. 808-330-4399 Problems, suggestions; ■ Report attached	

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency Hawaii Department of Health
Contact Eric Sadoyama — Remedial Project Manager — Jan 26, 2015 — 808-586-4249
Name / Title / Date / Phone no.
Problems; suggestions; ■ Report attached

Agency
Contact
Name / Title / Date / Phone no.
Problems; suggestions; ☐ Report attached

Agency
Contact
Name / Title / Date / Phone no.
Problems; suggestions; ☐ Report attached

Agency
Contact
Name / Title / Date / Phone no.
Problems; suggestions; ☐ Report attached

4. **Other interviews** (optional) ■ Report attached.

Bonnie Gottlieb, Assistant to O&M Supervisor, Jan. 26, 2015

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

■ O&M manual — ■ Readily available — ■ Up to date — ☐ N/A
■ As-built drawings — ■ Readily available — ■ Up to date — ☐ N/A
■ Maintenance logs — ■ Readily available — ■ Up to date — ☐ N/A

Remarks All of the above documents were brought out and displayed prior to inspection team arrival. Refer to 2010 checklist for specific document information.

2. **Site-Specific Health and Safety Plan** — ■ Readily available — ■ Up to date — ☐ N/A
■ Contingency plan/emergency response plan — ■ Readily available — ■ Up to date — ☐ N/A

Remarks This document was displayed prior to inspection team arrival.

3.	**O&M and OSHA Training Records** Remarks	■ Readily available	☐ Up to date	☐ N/A
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	■ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	■ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	■ N/A
	☐ Other permits______________ Remarks	☐ Readily available	☐ Up to date	■ N/A
5.	**Gas Generation Records** Remarks	☐ Readily available	☐ Up to date	■ N/A
6.	**Settlement Monument Records** Remarks Consent Decree with James Campbell Co., LLC (March 2007); 2009 Institutional Controls Annual Report (LFR, Oct. 2009); latest ICAP forwarded to USACE NWS	■ Readily available	☐ Up to date	☐ N/A
7.	**Groundwater Monitoring Records** Remarks Groundwater monitoring reports are submitted to EPA and Hawaii Department of Health.	■ Readily available	■ Up to date	☐ N/A
8.	**Leachate Extraction Records** Remarks	☐ Readily available	☐ Up to date	■ N/A
9.	**Discharge Compliance Records**			
	☐ Air	■ Readily available	■ Up to date	☐ N/A
	☐ Water (effluent) Remarks	■ Readily available	■ Up to date	☐ N/A
10.	**Daily Access/Security Logs** Remarks	■ Readily available	■ Up to date	☐ N/A

IV. O&M COSTS

1. **O&M Organization**

- ☐ State in-house
- ☐ PRP in-house
- ☐ Federal Facility in-house
- ☐ Other
- ☐ Contractor for State
- ☒ Contractor for PRP
- ☐ Contractor for Federal Facility

2. **O&M Cost Records**

☒ Readily available ☒ Up to date ☒ Funding mechanism/agreement in place

Original O&M cost estimate $7.17M ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
1-1-2010	12-31-2010	$1,007,960.47	☐ Breakdown attached
1-1-2011	12-31-2011	$959,386.70	☐ Breakdown attached
1-1-2012	12-31-2012	$1,143,240.84	☐ Breakdown attached
1-1-2013	12-31-2013	$962,156.20	☐ Breakdown attached
1-1-2014	12-31-2014	$691,262.32	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons:

The following maintenance information was provided:

Disposal, Granulated Activated Carbon, SVE and KWTS, 6000 pounds, $18,601.12, Yr 2012
Motor Replacement, 200 HP, Kunia Well, $186,983.67, Yr 2012
Replacement of minor parts, $4,660.00, Yr 2013

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks There are fences around the perched aquifer source/treatment area and the phytoremediation area. Gates are always locked and locks are in good condition.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A

Remarks "No Trespassing" signs and "Emergency Contact" signs are posted on the fences.

C. Institutional Controls (ICs)	
1. **Implementation and enforcement** Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A Type of monitoring (*e.g.*, self-reporting, drive by) Daily personnel onsite, gates locked on weekends. Frequency Daily Responsible party/agency Second City Property Management Inc. Contact Shane Lee (Name) O&M Supervisor (Title) (Date) 808-330-4399 (Phone no.) Reporting is up-to-date ☒ Yes ☐ No ☐ N/A Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A Violations have been reported ☐ Yes ☐ No ☒ N/A Other problems or suggestions: ☐ Report attached	
2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A Remarks	
D. General	
1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident Remarks	
2. **Land use changes on site** ☒ N/A Remarks	
3. **Land use changes off site** ☒ N/A Remarks	
VI. GENERAL SITE CONDITIONS	
A. Roads ☒ Applicable ☐ N/A	
1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A Remarks Roads are well defined but unpaved.	

B. Other Site Conditions
Remarks

VII. LANDFILL COVERS ■ Applicable ☐ N/A		
A. Landfill Surface		
1. **Settlement** (Low spots) Areal extent________ Remarks	☐ Location shown on site map Depth________	■ Settlement not evident
2. **Cracks** Lengths________ Widths________ Remarks	☐ Location shown on site map Depths________	■ Cracking not evident
3. **Erosion** Areal extent________ Remarks	☐ Location shown on site map Depth________	■ Erosion not evident
4. **Holes** Areal extent________ Remarks	☐ Location shown on site map Depth________	■ Holes not evident
5. **Vegetative Cover** ■ Grass ■ Cover properly established ■ No signs of stress ☐ Trees/Shrubs (indicate size and locations on a diagram) Remarks Vegetative cover is in good condition and well maintained.		
6. **Alternative Cover (armored rock, concrete, etc.)** Remarks		■ N/A
7. **Bulges** Areal extent________ Remarks	☐ Location shown on site map Height________	■ Bulges not evident

8.	**Wet Areas/Water Damage** ☐ Wet areas ☐ Ponding ☐ Seeps ☐ Soft subgrade Remarks	■ Wet areas/water damage not evident ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map	 Areal extent________ Areal extent________ Areal extent________ Areal extent________
9.	**Slope Instability** ☐ Slides Areal extent________ Remarks	☐ Location shown on site map	■ No evidence of slope instability
B. Benches	■ N/A	☐ Applicable	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench** Remarks	☐ Location shown on site map	☐ N/A or okay
2.	**Bench Breached** Remarks	☐ Location shown on site map	☐ N/A or okay
3.	**Bench Overtopped** Remarks	☐ Location shown on site map	☐ N/A or okay
C. Letdown Channels	■ Applicable	☐ N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** Areal extent________ Remarks	☐ Location shown on site map Depth________	■ No evidence of settlement
2.	**Material Degradation** Material type________ Remarks The diversion channel was observed and is in good condition.	☐ Location shown on site map Areal extent________	■ No evidence of degradation
3.	**Erosion** Areal extent________ Remarks There was no evidence of unusual erosion or scouring in the inspected areas.	☐ Location shown on site map Depth________	■ No evidence of erosion

4.	**Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting Areal extent__________ Depth__________ Remarks
5.	**Obstructions** Type__________ ☒ No obstructions ☐ Location shown on site map Areal extent__________ Size__________ Remarks
6.	**Excessive Vegetative Growth** Type__________ ☒ No evidence of excessive growth ☒ Vegetation in channels does not obstruct flow ☐ Location shown on site map Areal extent__________ Remarks
D. Cover Penetrations	☒ Applicable ☐ N/A
1.	**Gas Vents** ☒ N/A ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration Remarks
2.	**Gas Monitoring Probes** ☒ Properly secured/locked ☒ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks
3.	**Monitoring Wells** (within surface area of landfill) ☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks Monitoring wells were clearly labeled, locked, and in good condition. The basal wells observed in the remote locations were protected by brightly painted bollards.
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A Remarks
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A Remarks

E. Gas Collection and Treatment ☐ Applicable ■ N/A	
1.	**Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks
F. Cover Drainage Layer ☐ Applicable ■ N/A	
1.	**Outlet Pipes Inspected** ☐ Functioning ☐ N/A Remarks
2.	**Outlet Rock Inspected** ☐ Functioning ☐ N/A Remarks
G. Detention/Sedimentation Ponds ☐ Applicable ■ N/A	
1.	**Siltation** ☐ N/A ☐ Siltation not evident Areal extent______________ Depth____________ Remarks
2.	**Erosion** Areal extent______________ Depth____________ ☐ Erosion not evident Remarks
3.	**Outlet Works** ☐ Functioning ☐ N/A Remarks
4.	**Dam** ☐ Functioning ☐ N/A Remarks

H. Retaining Walls ☐ Applicable ■ N/A	
1.	**Deformations** ☐ Location shown on site map ☐ Deformation not evident Horizontal displacement__________ Vertical displacement__________ Rotational displacement__________ Remarks
2.	**Degradation** ☐ Location shown on site map ☐ Degradation not evident Remarks
I. Perimeter Ditches/Off-Site Discharge ■ Applicable ☐ N/A	
1.	**Siltation** ☐ Location shown on site map ■ Siltation not evident Areal extent__________ Depth__________ Remarks
2.	**Vegetative Growth** ☐ Location shown on site map ■ N/A ■ Vegetation does not impede flow Areal extent__________ Type__________ Remarks
3.	**Erosion** ☐ Location shown on site map ■ Erosion not evident Areal extent__________ Depth__________ Remarks
4.	**Discharge Structure** ■ Functioning ☐ N/A Remarks Both drainage feature and diversion channel appear in functional condition.
VIII. VERTICAL BARRIER WALLS ☐ Applicable ■ N/A	
1.	**Settlement** ☐ Location shown on site map ☐ Settlement not evident Areal extent__________ Depth__________ Remarks
2.	**Performance Monitoring** Type of monitoring__________ ■ Performance not monitored ☐ Evidence of breaching Frequency__________ Head differential__________ Remarks
IX. GROUNDWATER/SURFACE WATER REMEDIES ■ Applicable ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ■ Applicable ☐ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ■ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks All equipment appeared to be in good working order. Equipment areas were orderly and free of clutter, trash, spare parts, or tripping hazards.

2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☒ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
C. Treatment System ☒ Applicable ☐ N/A	
1.	**Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☒ Air stripping ☒ Carbon adsorbers ☐ Filters_____ ☐ Additive (*e.g.*, chelation agent, flocculent)_____ ☒ Others Phytoremediation ☒ Good condition ☐ Needs Maintenance ☒ Sampling ports properly marked and functional ☒ Sampling/maintenance log displayed and up to date ☒ Equipment properly identified ☒ Quantity of groundwater treated annually See Below ☐ Quantity of surface water treated annually_____ Remarks Treated Groundwater: 251,557,677 gal. (2010); 180,891,720 gal. (2011); 202,574,700 gal. (2012); 228,883,200 gal. (2013); 157,472,112 gal. (2014)
2.	**Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☒ Good condition ☐ Needs Maintenance Remarks

3.	**Tanks, Vaults, Storage Vessels** ☐ N/A ■ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks Perched water holding tank and associated piping appeared to be in good condition.	
4.	**Discharge Structure and Appurtenances** ☐ N/A ■ Good condition ☐ Needs Maintenance Remarks	
5.	**Treatment Building(s)** ☐ N/A ■ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks	
6.	**Monitoring Wells** (pump and treatment remedy) ■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks Monitoring wells appeared to be in good condition. Several remote basal monitoring wells were observed in good condition, including BMW-3, -4, -5, -6, and -7.	
D. Monitoring Data		
1.	Monitoring Data ■ Is routinely submitted on time ■ Is of acceptable quality	
2.	Monitoring data suggests: ■ Groundwater plume is effectively contained ■ Contaminant concentrations are declining	
D. Monitored Natural Attenuation		
1.	**Monitoring Wells** (natural attenuation remedy) ■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks	
X. OTHER REMEDIES		
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.		

A. Soil Vapor Extraction Wells, Pumps, and Pipelines ■ Applicable ☐ N/A

1. Pumps, Wellhead Plumbing, and Electrical
   ■ Good Condition ■ Wells Operating Properly ☐ Needs Maintenance ☐ N/A
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances
   ■ Good Condition ■ No apparent leaks ☐ Needs Maintenance ☐ N/A
3. White Perched Water Holding Tank
   ■ Good Condition ■ No apparent leaks ☐ Needs Maintenance ☐ N/A

B. Phytoremediation System ■ Applicable ☐ N/A

1. Overall Condition
   ■ No vegetative overgrowth ■ Trees in good condition ■ Landscape Maintained ☐ Needs Maintenance
2. Irrigation System
   ■ Plumbing in good condition ■ No apparent leaks ■ Drip hoses in good condition ☐ Needs Maintenance

XI. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The Remedial Action Objectives specified in the Record of Decision for the Del Monte Corp Superfund site are to prevent exposure of the public to contaminated groundwater, inhibit further migration of the contaminant plume away from the source area, limit infiltration of perched groundwater and deep soil contaminants to basal groundwater, and restore basal groundwater to drinking water quality in a reasonable timeframe

It appears that the remedy is effective and functioning as designed based on the data collected. The site inspection indicates that the treatment facilities are being maintained that would allow it to continue to effectively remediate the contamination at the site Note that the Waikakalaua well is no longer being sampled since the construction of BMW-7 Second City continues to include the HCC well for monitoring purposes It was noted that a trial shutdown of the treatment system was started in November 2014. The objective of the trial shutdown is to evaluate the potential for using Monitored Natural Attenuation (MNA) as a remedy for the site.

B.	**Adequacy of O&M**

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

A site inspection was completed on January 26, 2015. The US EPA was the lead agency for the inspection and interviews The interviews were held with the Golder project manager, two Second City employees, and the Hawaii DOH remedial project manager Similar to the observations made during the 2010 site visit, the basal and perched treatment systems, O&M activities and documentation all appeared to be in order and in compliance with the O&M manuals and Compliance Monitoring Plan The O&M team appears to have the proper knowledge and skills to operate, maintain, and monitor the treatment system They were able to successfully effect repairs or replacement of critical components such as pumps and carbon adsorption media. They also displayed sufficient knowledge of waste disposal regulations which was important in the proper disposal of the spent granulated activated carbon media from the KWTS treatment tower. Based on this site visit, it is believed that the current operators of the treatment facility is able to preserve the current and long-term protectiveness of the remedy.

C.	**Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

There were no major problems reported with the use of the dedicated point-source bailers for collecting the water samples. No other significant or unexpected issued were observed or discussed during the site visit

D.	**Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

There was no discussion of possible opportunities for optimization of monitoring tasks or the operation of the remedy during the site visit

Inspection Team Roster

Project/Site: Del Monte Superfund Site, Kunia Village, Oahu, Hawaii
Date: January 26, 2015

Name	Organization
Christopher Lichens	U.S. EPA Region IX
Eric Sadoyama	Hawaii DOH
Gary Zimmerman	Golder Associates
Shane Lee	Second City Property Management
Bonnie Gottlieb	Second City Property Management
Indira Balkissoon	Tech Law Inc. (EPA Consultant)
Mark Arakaki	Army Corps

Appendix E: Photographs from Site Inspection Visit

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Photos from Site Inspection January 26, 2015

Photo 1: BMW-1 Interior.

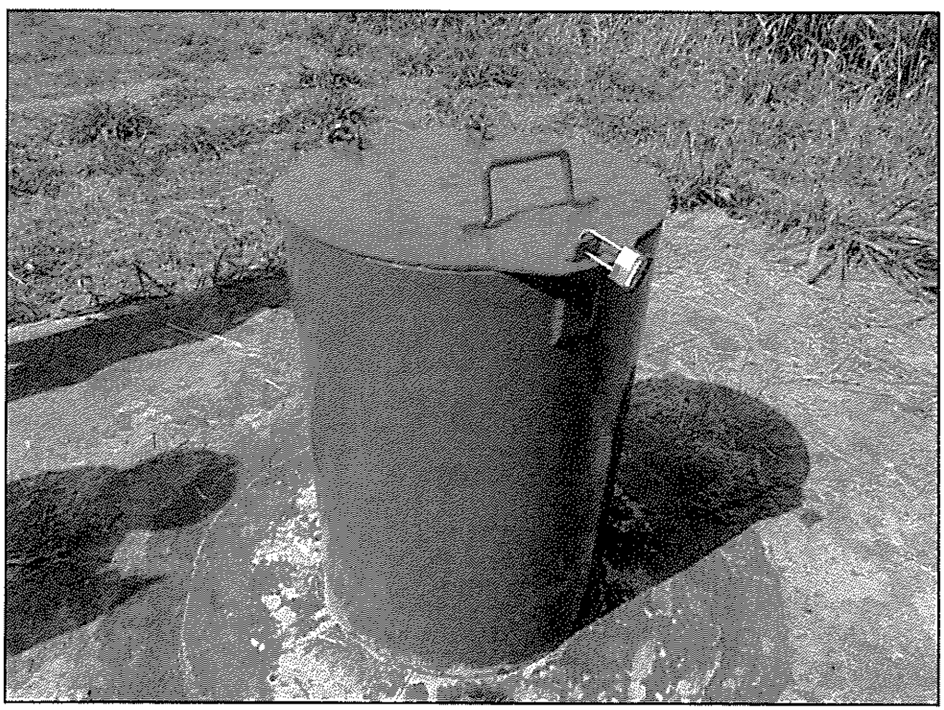

Photo 2: BMW-1 Exterior.

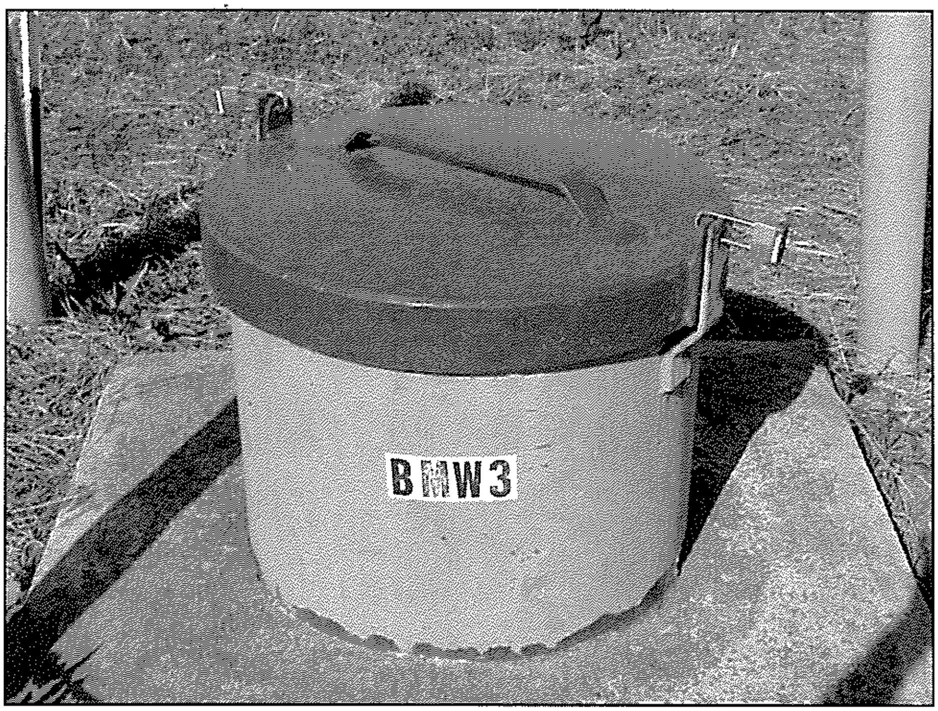

Photo 3: BMW-3 Exterior.

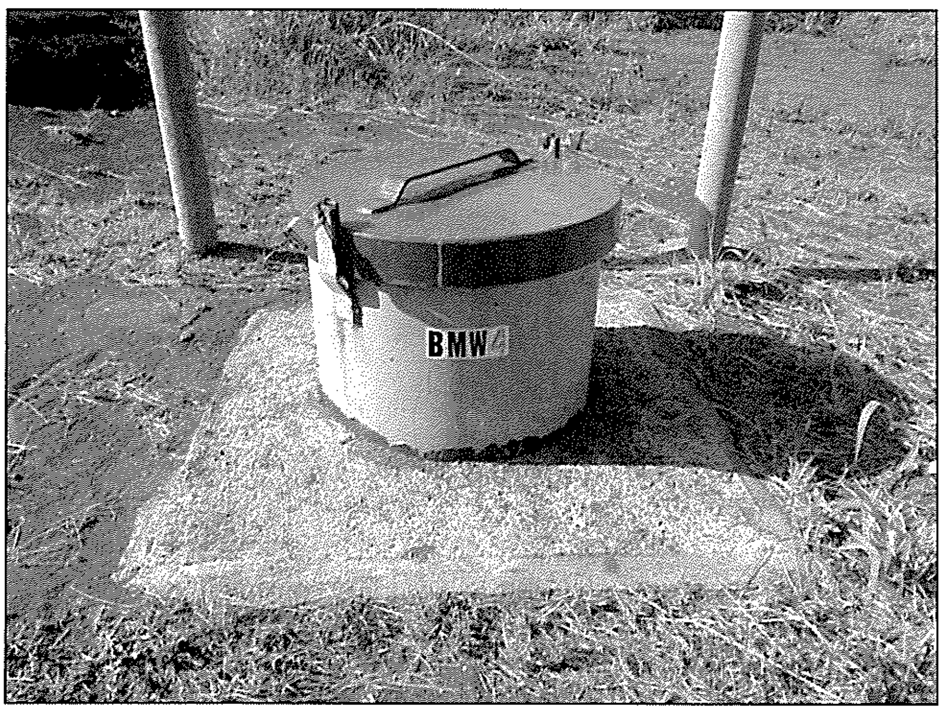

Photo 4: BMW-4 Exterior.

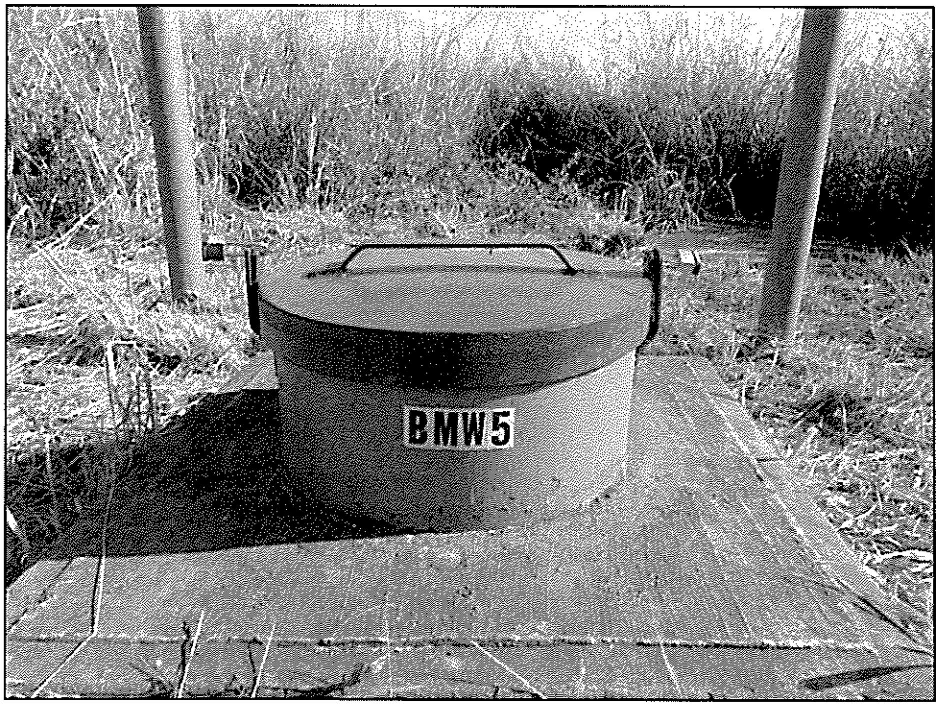

Photo 5: BMW-5 Exterior.

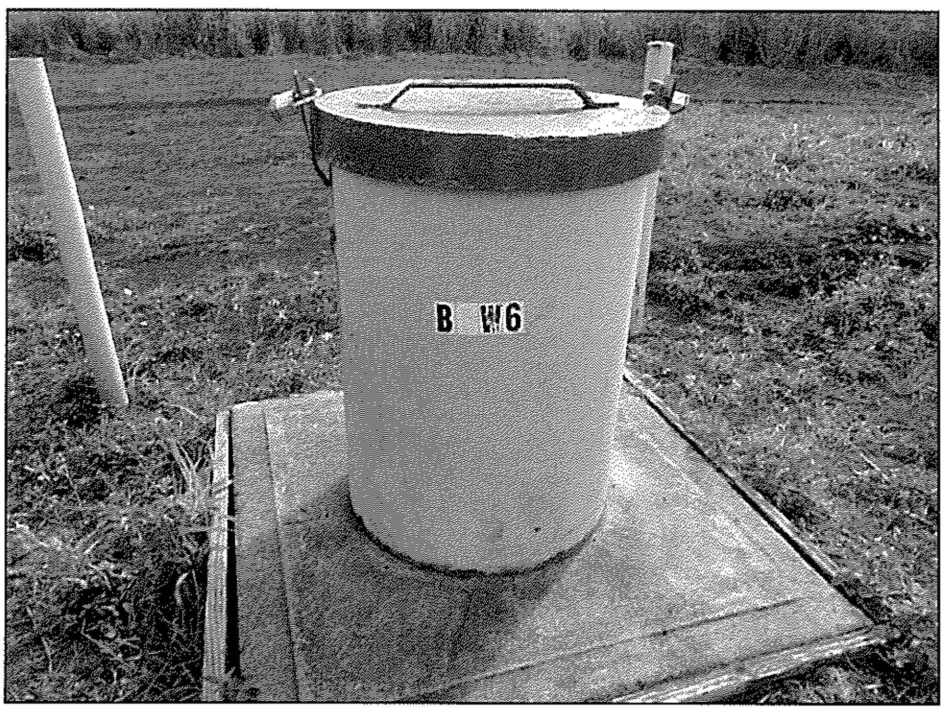

Photo 6: BMW-6 Exterior.

Photo 7: BMW-7 Exterior.

Photo 8: EW42 Dual Soil Vapor Extraction And Perched Groundwater Extraction Pump.

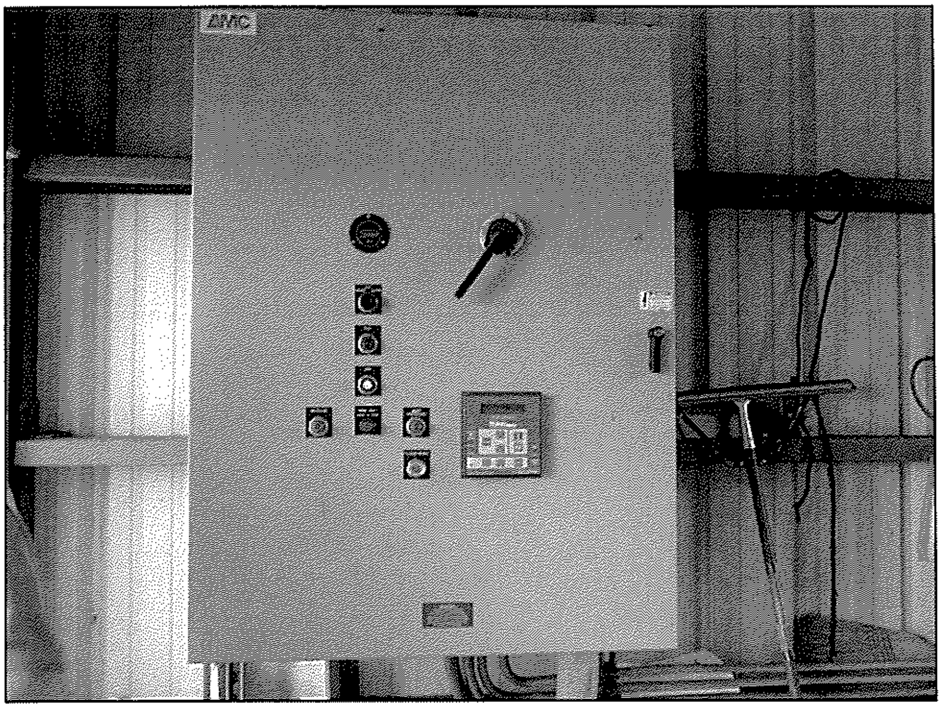

Photo 9: Kunia Well Control Panel.

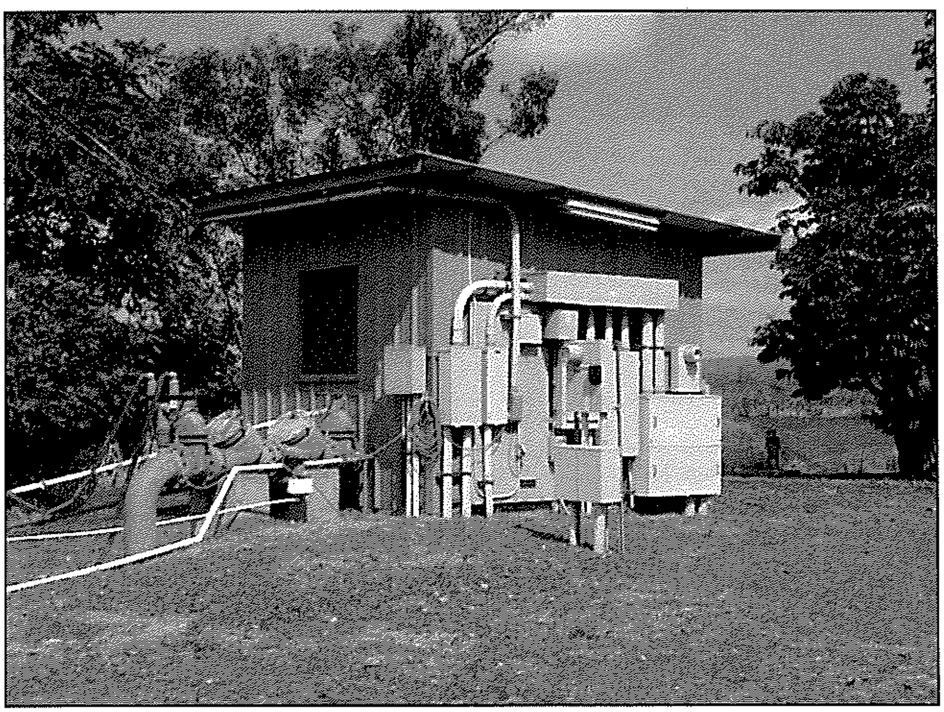

Photo 10: Kunia Well Pump House.

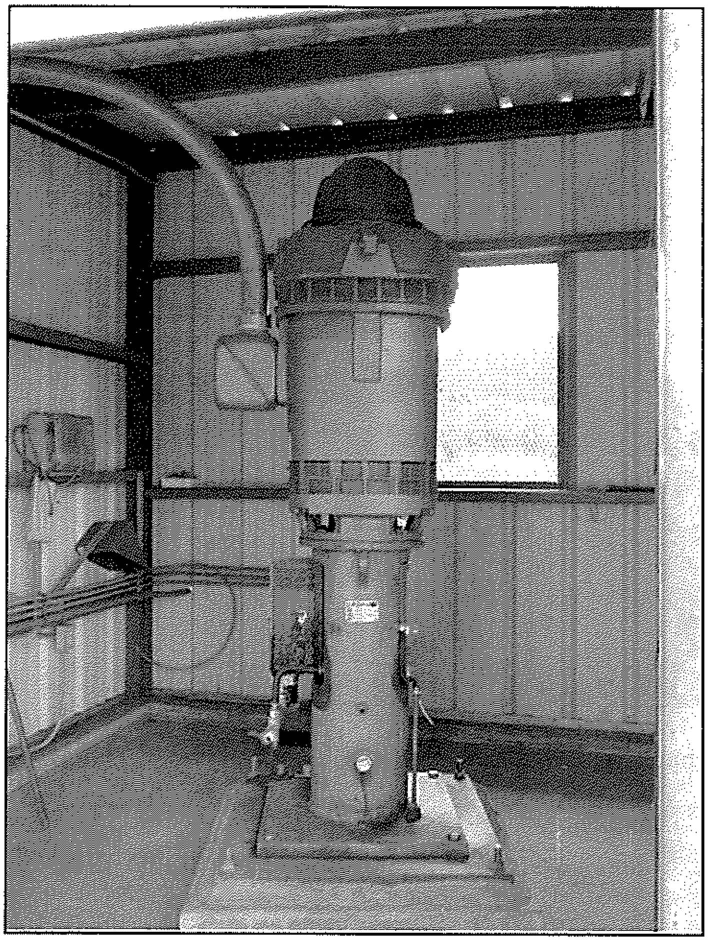

Photo 11. Kunia Well Pump.

Photo 12: Kunia Well Treatment System Air Stripper.

Photo 13: Kunia Well Treatment System Carbon Adsorber.

Photo 14: Kunia Well Treatment System Signage.

Photo 15: Kunia Well Treatment System Signage.

Photo 16: Monitoring well, MW-15, part of Perched Aquifer.

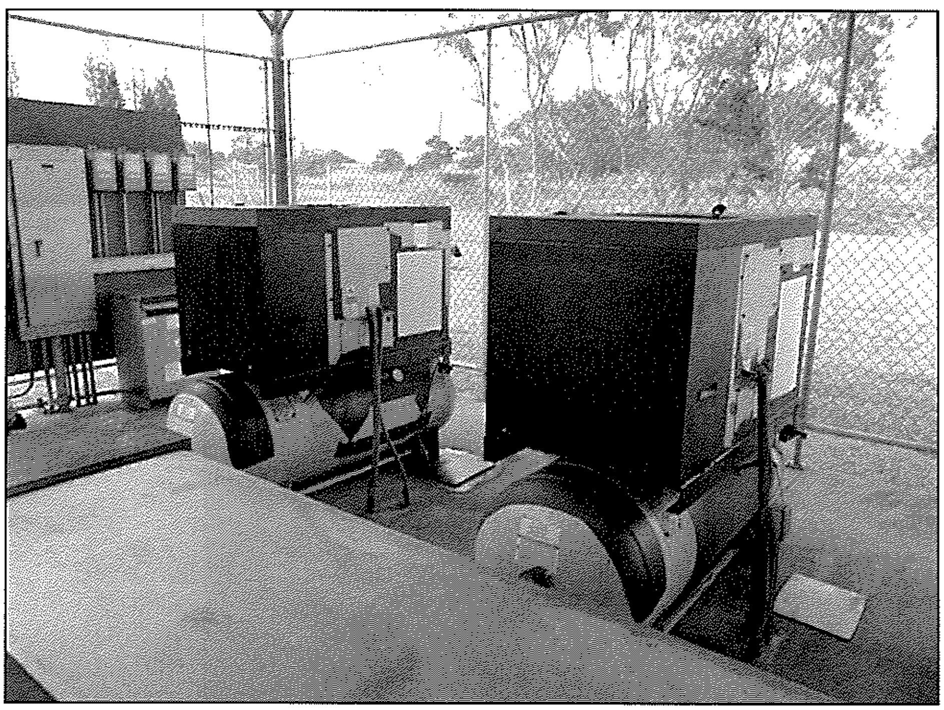

Photo 17: Perched Aquifer Treatment System Compressors.

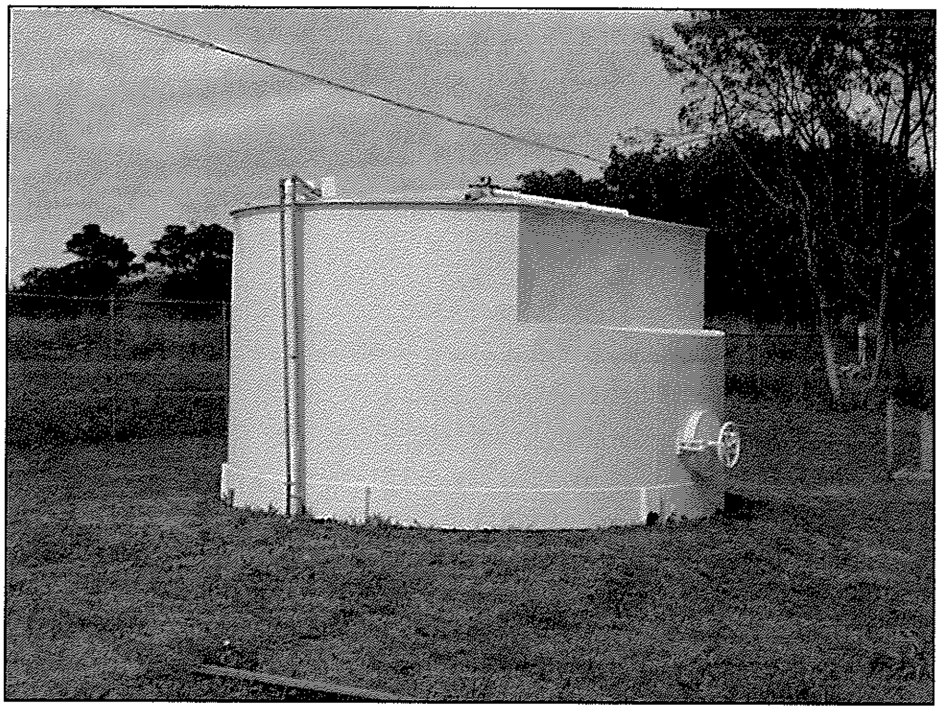

Photo 18: Perched Aquifer Treatment System Holding Tank.

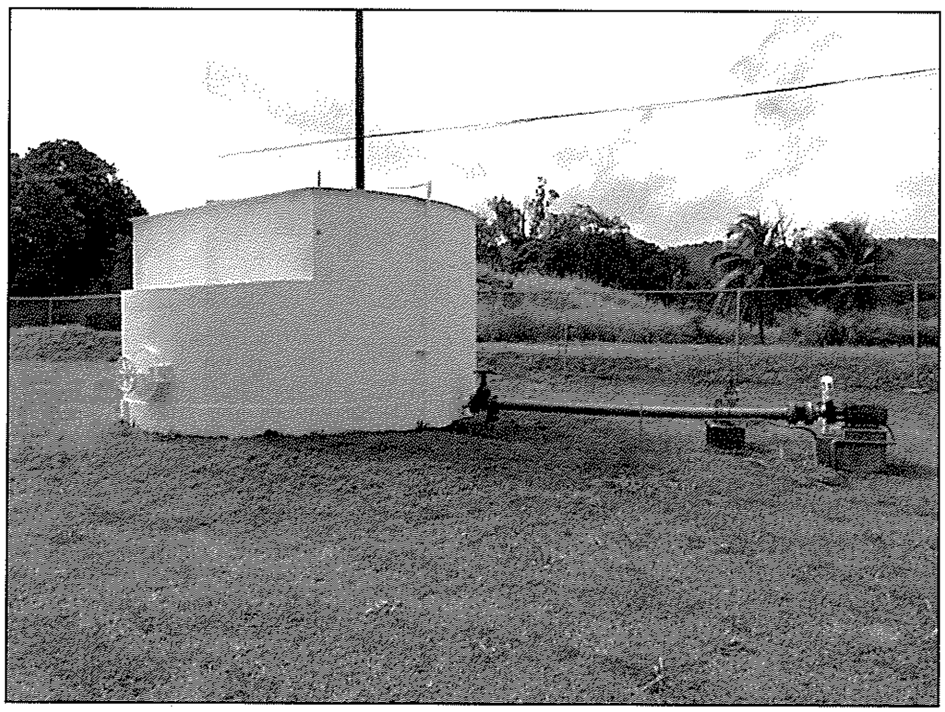

Photo 19: Perched Aquifer Treatment System Holding Tank.

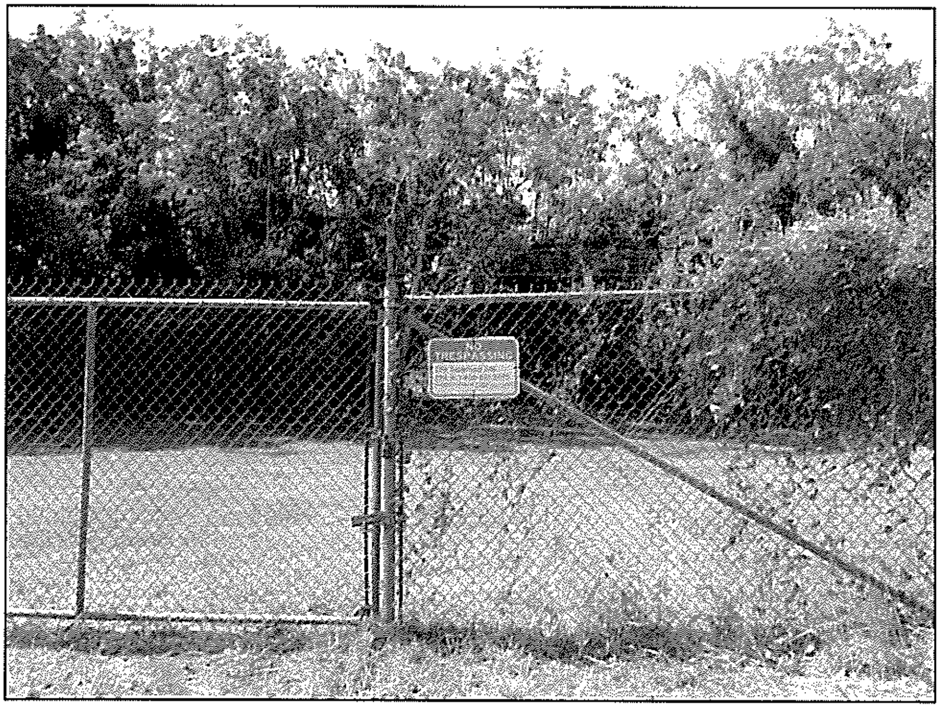

Photo 20: Phytoremediation Area Warning Signage.

Photo 21: Phytoremediation Area.

Photo 22: Phytoremediation Area.

Photo 23: Phytoremediation Area.

Photo 24: Phytoremediation Area Drip Hose.

Photo 25: SVE 40 HP Vacuum Pump.

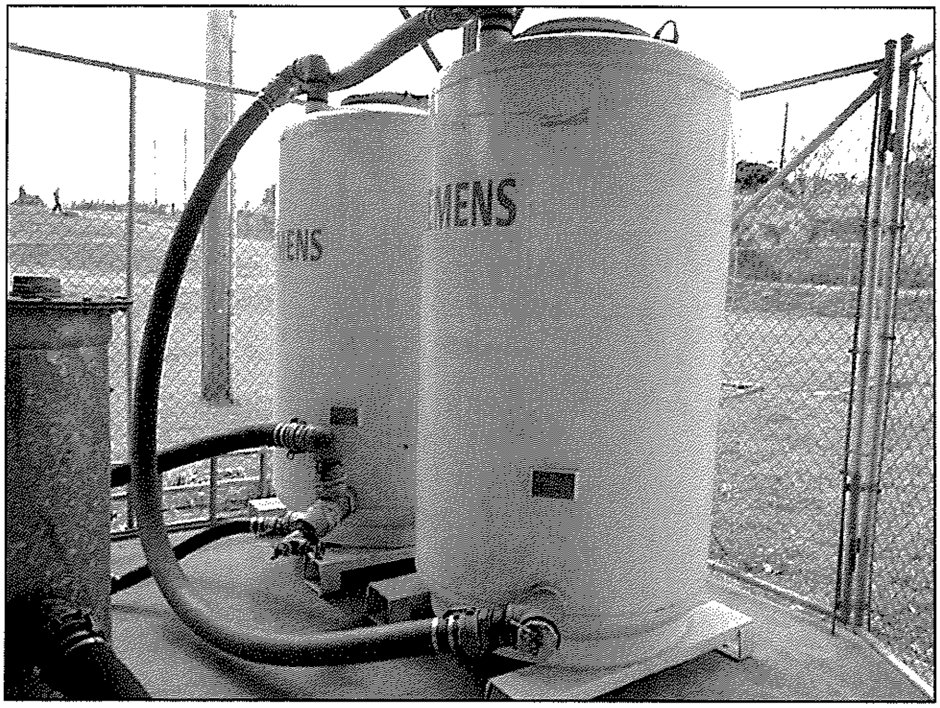

Photo 26: SVE Carbon Tanks.

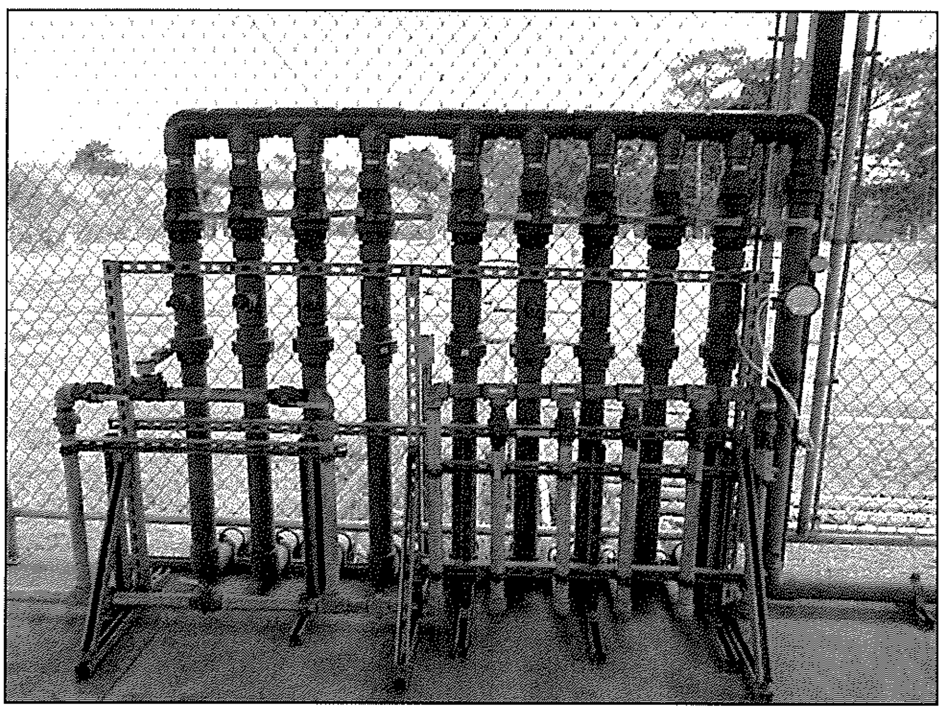

Photo 27: SVE Header Manifold.

Appendix F: Data Review Tables

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Perched Aquifer Data Table January 2010 to July 2014

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
EW-02	4/19/2011	0.32	J	1.3		0.5	U	11	
EW-10	4/19/2011	24		67		3.7		370	
EW-10	7/19/2011	3.1		18		2.7		230	
EW-13	4/19/2011	1.3		1.3		0.14	J	9.4	
EW-13	10/18/2011	1.6		8.3		0.32	J	20	
EW-14	4/19/2011	0.44	J	1	U	0.5	U	3.2	
EW-14	10/18/2011	0.5	U	1	U	0.5	U	4	
EW-15	4/6/2010	0.48	J	1.7		0.16	J	15	
EW-15	7/13/2010	0.11	J	1	U	0.5	U	19	
EW-15	10/12/2010	0.3	J	1.4		0.23	J	22	
EW-15	4/19/2011	31		110		2.6		310	
EW-15	7/19/2011	85		260		5.6		1000	
EW-15	10/18/2011	37		210		2.9		560	
EW-15	4/24/2012	0.16	J	1.8		0.5	U	3.6	
EW-16	1/19/2010	0.42	J	1	U	0.5	U	12	
EW-16	4/6/2010	0.77		1	U	0.5	U	19	
EW-16	7/13/2010	0.5	U	1	U	0.5	U	70	J
EW-16	10/12/2010	0.19	J	1		0.33	J	99	
EW-16	1/11/2011	0.5	U	1	U	0.12	J	31	
EW-16	4/19/2011	0.5	U	1	U	0.5	U	3.1	
EW-16	7/19/2011	0.5	U	1	U	0.5	U	4.2	
EW-16	10/18/2011	0.5	U	1	U	0.5	U	4.6	
EW-16	1/17/2012	0.12	J	1	U	0.5	U	24	
EW-16	4/24/2012	0.2	J	1	U	0.15	J	93	
EW-16	7/24/2012	0.5	U	1	U	0.5	U	15	J
EW-28	4/19/2011	0.7		1.1		0.5	U	10	
EW-31	1/20/2010	0.5	U	1	U	0.5	U	1.1	
EW-31	1/20/2010	0.5	U	1	U	0.5	U	1.4	
EW-31	4/6/2010	0.5	U	1	U	0.5	U	0.96	
EW-31	7/14/2010	0.5	U	1	U	0.5	U	0.68	
EW-31	10/13/2010	0.5	U	1	U	0.5	U	5.5	
EW-31	4/19/2011	0.5	U	1	U	0.5	U	2.2	
EW-31	7/19/2011	0.18	J	1	U	0.57		1.6	
EW-32	1/20/2010	24		100		4.8		760	
EW-32	4/6/2010	0.39	J	2.8		0.37	J	20	
EW-32	4/19/2011	10		31		1.9		180	
EW-32	7/19/2011	0.16	J	1	U	0.54		1.3	

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
EW-32	10/18/2011	0.43	J	1.8		0.12	J	17	
EW-33	1/19/2010	0.91		1	U	0.78		2.7	
EW-33	4/7/2010	2.8		1	U	0.79		6.6	
EW-33	7/13/2010	3.1		1	U	1.2		8.8	
EW-33	10/12/2010	0.5		1	U	1.1		6.5	
EW-33	1/11/2011	2.2		7.5		0.78		21	
EW-33	1/11/2011	2.2		7.4		0.74		20	
EW-33	4/19/2011	0.15	J	1	U	0.59		1.4	
EW-33	7/19/2011	1.5		1	U	0.78		6.2	
EW-33	4/24/2012	0.11	J	1	U	0.9		2.1	
EW-33	7/24/2012	1.3		1	U	0.88		5.9	
EW-33	10/23/2012	1.1		1	U	1.2		5.6	
EW-33	1/15/2013	0.38	J	1	U	0.83		2.7	
EW-33	4/30/2013	1.1		1	U	0.86		3.5	
EW-33	7/23/2013	0.82		1	U	0.75		3.5	
EW-33	10/15/2013	0.82		1	U	0.96		2.9	
EW-33	1/14/2014	0.72		1	U	0.68		3.2	
EW-33	7/9/2014	0.74		1	U	0.7		2.2	
EW-33	7/9/2014	0.76		1	U	0.64		2.3	
EW-34	1/20/2010	5.9		4.8		0.9		66	
EW-34	4/6/2010	0.51		0.46	J	0.23	J	2.4	
EW-34	4/19/2011	1		0.61	J	0.56		12	
EW-35	10/13/2010	0.5	U	1	U	0.5	U	7.6	
EW-35	4/19/2011	0.31	J	1.2		0.5	U	12	
EW-35	7/19/2011	10		48		0.91		150	
EW-36	1/19/2010	0.5	U	1	U	0.7		1.5	
EW-36	4/6/2010	0.5	U	1	U	0.71		1.5	
EW-36	4/6/2010	0.5	U	1	U	0.69		1.6	
EW-36	7/13/2010	0.5	U	1	U	1		2.5	
EW-36	10/12/2010	0.5	U	1	U	0.87		2.6	
EW-36	1/11/2011	0.5	U	1	U	1.1		2.8	
EW-36	4/19/2011	0.5	U	1	U	0.63		1.5	
EW-36	7/19/2011	0.5	U	1	U	0.57		1.1	
EW-36	10/18/2011	0.5	U	1	U	0.67		1.4	
EW-36	1/17/2012	0.5	U	1	U	0.87		2.2	
EW-36	4/24/2012	0.5	U	1	U	0.89		2.5	
EW-36	7/24/2012	0.5	U	1	U	1.2		3	
EW-36	10/23/2012	0.5	U	1	U	0.92		2.2	
EW-36	1/15/2013	0.5	U	1	U	1.1		2.4	
EW-36	4/30/2013	0.5	U	1	U	1.1		2.4	

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
EW-36	7/23/2013	0.5	U	1	U	0.45	J	0.9	
EW-36	10/15/2013	0.5	U	1	U	0.8		1.3	
EW-36	10/15/2013	0.5	U	1	U	0.74		1.3	
EW-36	1/14/2014	0.67		8.6		1		23	
EW-36	7/8/2014	0.5	U	1	U	0.9		3.6	
EW-37	1/20/2010	55		48		4.7		650	
EW-37	4/6/2010	32		37		4.2		570	
EW-37	7/14/2010	21		31		5	U	240	
EW-37	10/13/2010	66		74		4.5		280	
EW-37	1/11/2011	6.9		24		1.4		85	
EW-37	4/19/2011	0.5	U	1	U	0.53		1.1	
EW-37	7/19/2011	110		100		4.8		590	
EW-37	10/18/2011	34		52		2.8		400	
EW-37	1/17/2012	17		26		2.1		540	
EW-37	4/24/2012	150		190		10		1100	
EW-37	7/24/2012	43		66		4.1		570	
EW-37	1/15/2013	68		96		6.8		810	
EW-37	1/15/2013	73		98		6.8		790	
EW-37	4/30/2013	49		75		7		550	
EW-37	7/23/2013	29		72		4		620	
EW-37	4/16/2014	7.7		27		2.3		140	
EW-38	1/19/2010	120		95		2.7		840	
EW-38	4/19/2011	1.7		58		1.8		21	
EW-38	10/18/2011	0.57		56		2.9		39	
EW-38	1/18/2012	1.6		87		3.2		30	
EW-38	7/24/2012	0.32	J	43		2.2		15	
EW-38	4/30/2013	1.4		75		3.1		52	
EW-38	7/23/2013	0.15	J	27		1.4		8.5	
EW-38	10/15/2013	0.5	U	34		2.1		38	
EW-38	1/14/2014	0.5	U	13		1.7		24	
EW-38	7/9/2014	0.32	J	29		1.6		12	
EW-41	1/19/2010	0.15	J	1	U	0.53		2.3	
EW-41	4/6/2010	1.3		0.65	J	0.49	J	14	
EW-41	1/11/2011	0.45	J	0.21	J	0.48	J	6.3	
EW-41	4/19/2011	0.42	J	0.33	J	0.48	J	4.1	
EW-41	7/20/2011	0.5	U	1	U	0.68		2.9	
EW-41	10/18/2011	0.59		0.42	J	0.48	J	6.5	
EW-41	1/17/2012	0.36	J	1	U	0.44	J	7.1	
EW-41	4/24/2012	0.26	J	1	U	0.57		13	
EW-41	7/24/2012	0.49	J	0.35	J	0.56		9	

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
EW-41	10/23/2012	0.23	J	1	U	0.46	J	2	
EW-41	4/30/2013	0.21	J	0.46	J	0.4	J	2.6	
EW-41	7/23/2013	0.31	J	1	U	0.47	J	2.9	
EW-41	10/15/2013	0.19	J	0.25	J	0.41	J	2.3	
EW-41	1/14/2014	0.3	J	1	U	0.36	J	3.5	
EW-41	7/8/2014	0.5	U	1	U	0.5	U	0.35	J
EW-42	1/19/2010	4.1		1.5		1.1		63	
EW-42	4/6/2010	3		2.6		1.2		88	
EW-42	7/13/2010	6.5		40		2.7	J	470	
EW-42	10/12/2010	4.2		7.2		1.6		170	
EW-42	1/11/2011	10		49		3.4		450	
EW-42	4/19/2011	8.7		43		2.7		340	
EW-42	7/19/2011	2.3		2.4		0.96		120	
EW-42	10/18/2011	8		39		2.4		120	
EW-42	1/17/2012	9.5		53		2.5		190	
EW-42	4/24/2012	2.5		9.1		1.6		92	
EW-42	7/24/2012	10		72		3.8		310	
EW-42	1/15/2013	5.6		30		2.2		96	
EW-42	4/30/2013	6.7		26		2.4		240	
EW-42	7/23/2013	14		70		2.9		260	
HW-03	1/19/2010	0.5	U	1	U	0.49	J	0.74	
HW-03	4/6/2010	0.5	U	1	U	0.41	J	0.68	
HW-03	7/13/2010	0.5	U	1	U	0.44	J	0.74	J
HW-03	10/12/2010	0.5	U	1	U	0.46	J	0.87	
HW-03	1/11/2011	0.5	U	1	U	0.56		1.1	
HW-03	4/19/2011	0.5	U	1	U	0.55		1	
HW-03	7/19/2011	0.5	U	1	U	0.53		0.98	
HW-03	10/18/2011	0.5	U	1	U	0.5		0.95	J
HW-03	1/17/2012	0.5	U	1	U	0.56		1	
HW-03	4/24/2012	0.5	U	1	U	0.53		0.82	
HW-03	7/24/2012	0.5	U	1	U	0.42	J	0.82	
HW-03	10/23/2012	0.5	U	1	U	0.5		1	
HW-03	1/15/2013	0.5	U	1	U	0.47	J	0.77	
HW-03	4/30/2013	0.5	U	1	U	0.58		0.96	
HW-03	7/23/2013	0.5	U	1	U	0.36	J	0.77	
HW-03	10/15/2013	0.5	U	1	U	0.49	J	0.65	
HW-03	1/14/2014	0.5	U	1	U	0.4	J	0.62	
HW-03	4/16/2014	0.5	U	1	U	0.5		0.62	
HW-03	7/8/2014	0.5	U	1	U	0.41	J	0.68	
MW-05	1/14/2013	0.5	U	1	U	0.5	U	3.7	

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
MW-05	4/29/2013	0.5	U	1	U	0.21	J	2.6	
MW-06	1/14/2013	0.5	U	1	U	0.5	U	0.5	U
MW-06	4/29/2013	0.5	U	1	U	0.5	U	0.5	U
MW-06	7/22/2013	0.5	U	1	U	0.5	U	0.5	U
MW-06	10/14/2013	0.5	U	1	U	0.5	U	0.5	U
MW-06	1/13/2014	0.5	U	1	U	0.5	U	0.5	U
MW-06	4/16/2014	0.5	U	1	U	0.5	U	0.5	U
MW-06	7/8/2014	0.5	U	1	U	0.5	U	0.5	U
MW-13	4/6/2010	0.78		0.6	J	0.27	J	32	
MW-13	7/13/2010	1.7	J	9.5	J	5	U	260	
MW-13	10/12/2010	0.96		4.6		1.5		86	
MW-13	1/11/2011	0.35	J	0.44	J	0.16	J	15	
MW-13	4/19/2011	0.36	J	0.68	J	0.25	J	16	
MW-13	7/19/2011	0.53		2.3		1.2		90	
MW-13	10/18/2011	1.7		3.8		0.65		62	
MW-13	1/17/2012	2.6		13		1.1		54	
MW-13	4/24/2012	0.47	J	3.8		1.1		92	
MW-13	4/24/2012	0.46	J	3		1.1		77	
MW-13	7/24/2012	0.27	J	0.86		0.11	J	40	
MW-13	7/24/2012	0.63		1.7		0.48	J	9	
MW-13	1/15/2013	0.5	U	1.1		0.21	J	5.3	
MW-13	4/30/2013	0.25	J	1.5		0.6		43	
MW-13	4/30/2013	0.27	J	1.6		0.58		41	
MW-13	7/23/2013	0.23	J	1.5		0.4	J	25	
MW-13	7/23/2013	0.22	J	1.4		0.26	J	24	
MW-13	10/15/2013	0.083	J	0.78	J	0.29	J	21	
MW-13	1/14/2014	0.56		1.6		0.5	U	28	
MW-13	4/16/2014	0.082	J	1.3		0.5	U	7.1	
MW-13	7/8/2014	0.5	U	0.99	J	0.5	U	1.4	
MW-18	1/19/2010	2.1		3		1.2		64	
MW-18	1/11/2011	0.45	J	25		1.2		35	
MW-18	4/19/2011	2.5		21		1.5		58	
MW-18	7/19/2011	0.38	J	5		1.2		76	
MW-18	7/19/2011	0.37	J	4.7		1.1		79	
MW-18	10/18/2011	1.5		15		1.4		34	
MW-18	1/17/2012	1.1		21		1.8		23	
MW-18	7/24/2012	1.5		14		2.1		65	
MW-18	4/30/2013	2		11		1.7		130	
MW-18	7/23/2013	0.32	J	4.8		0.62		12	
MW-18	10/15/2013	0.2	J	3.1		0.43	J	12	

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
MW-18	1/14/2014	0.88		13		1.5		34	
MW-18	1/14/2014	0.99		14		1.4		34	
MW-23	1/18/2010	0.5	U	1	U	0.42	J	0.94	
MW-23	4/5/2010	0.5	U	1	U	0.44	J	0.83	
MW-23	7/12/2010	0.5	U	1	U	0.51		1	
MW-23	10/11/2010	0.5	U	1	U	0.5		0.9	
MW-23	1/10/2011	0.5	U	1	U	0.59		0.98	
MW-23	4/18/2011	0.5	U	1	U	0.6		0.79	
MW-23	7/18/2011	0.5	U	1	U	0.54		0.87	
MW-23	10/17/2011	0.5	U	1	U	0.48	J	0.83	
MW-23	1/16/2012	0.5	U	1	U	0.41	J	0.86	
MW-23	4/23/2012	0.5	U	1	U	0.51		0.94	
MW-23	7/23/2012	0.5	U	1	U	0.58		0.92	
MW-23	10/22/2012	0.5	U	1	U	0.55		0.98	
MW-23	1/14/2013	0.5	U	1	U	0.61		0.61	
MW-23	4/29/2013	0.5	U	1	U	0.68		1.1	
MW-23	7/22/2013	0.5	U	1	U	0.43	J	0.89	
MW-23	10/14/2013	0.5	U	1	U	0.58		0.81	
MW-23	1/13/2014	0.5	U	1	U	0.42	J	0.72	
MW-23	4/16/2014	0.5	U	1	U	0.58		0.86	
MW-23	7/8/2014	0.5	U	1	U	0.65		0.97	
MW-24	1/18/2010	0.11	J	1	U	0.27	J	1	
MW-24	4/5/2010	0.5	U	1	U	0.28	J	0.86	
MW-24	7/12/2010	0.075	J	1	U	0.29	J	0.84	
MW-24	10/11/2010	0.5	U	1	U	0.31	J	0.93	
MW-24	1/10/2011	0.5	U	1	U	0.5	U	0.11	J
MW-24	4/18/2011	0.5	U	1	U	0.28	J	0.47	J
MW-24	7/18/2011	0.5	U	1	U	0.29	J	0.54	
MW-24	10/17/2011	0.5	U	1	U	0.3	J	0.65	
MW-24	1/16/2012	0.5	U	1	U	0.19	J	0.54	
MW-24	4/23/2012	0.5	U	1	U	0.24	J	0.5	U
MW-24	7/23/2012	0.5	U	1	U	0.25	J	0.6	
MW-24	10/22/2012	0.5	U	1	U	0.5	U	0.4	J
MW-24	1/14/2013	0.5	U	1	U	0.5	U	0.5	U
MW-24	4/29/2013	0.5	U	1	U	0.5	U	0.5	U
MW-24	7/22/2013	0.5	U	1	U	0.5	U	0.5	U
MW-24	10/14/2013	0.5	U	1	U	0.18	J	0.3	J
MW-24	1/13/2014	0.5	U	1	U	0.5	U	0.27	J
MW-24	4/16/2014	0.5	U	1	U	0.5	U	0.24	J
MW-24	7/8/2014	0.5	U	1	U	0.22	J	0.51	

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
MW-5	4/18/2011	0.5	U	1	U	0.5	U	2.4	
MW-6	1/11/2011	0.5	U	1	U	0.088	J	0.087	J
MW-6	4/18/2011	0.5	U	1	U	0.5	U	0.5	U
MW-6	4/23/2012	0.5	U	1	U	0.5	U	0.5	U
MW-6	7/23/2012	0.5	U	1	U	0.5	U	0.5	U
MW-6	10/22/2012	0.5	U	1	U	0.5	U	0.5	U
Sump Cell A	1/19/2010	0.5	U	1	U	0.5	U	0.16	J
Sump Cell B	1/19/2010	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	4/6/2010	0.5	U	1	U	0.5	U	0.071	J
Sump Pump A	7/13/2010	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	10/12/2010	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	1/11/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	4/19/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	7/19/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	8/2/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	10/18/2011	0.5	U	1	U	0.5	U	0.37	J
Sump Pump A	1/17/2012	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	4/24/2012	0.5	U	1	U	0.5	U	1.1	
Sump Pump A	7/24/2012	0.5	U	1	U	0.5	U	0.3	J
Sump Pump A	10/23/2012	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	1/15/2013	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	4/30/2013	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	7/23/2013	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	10/15/2013	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	1/14/2014	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	4/15/2014	0.5	U	1	U	0.5	U	0.5	U
Sump Pump A	7/8/2014	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	4/6/2010	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	7/13/2010	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	10/12/2010	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	1/11/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	4/19/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	7/19/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	8/2/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	10/18/2011	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	1/17/2012	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	4/24/2012	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	7/24/2012	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	10/23/2012	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	1/15/2013	0.5	U	1	U	0.5	U	0.5	U

Well	Sample Date	EDB µg/L		DBCP µg/L		1,2,3-TCP µg/L		1,2-DCP µg/L	
Sump Pump B	4/30/2013	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	7/23/2013	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	10/15/2013	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	1/14/2014	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	4/15/2014	0.5	U	1	U	0.5	U	0.5	U
Sump Pump B	7/8/2014	0.5	U	1	U	0.5	U	0.5	U
White Tank	1/19/2010	1.9		9.9		0.61		20	
White Tank	4/6/2010	0.87		3.2		0.36	J	18	
White Tank	7/13/2010	4		7.1		0.52		42	
White Tank	10/12/2010	1.1		2.6		0.29	J	12	
White tank	1/11/2011	2.5		3.4		0.43	J	34	
White Tank	4/19/2011	1.6		5		0.5	U	21	
White Tank	7/19/2011	1		1.8		0.22	J	9.6	
White Tank	8/2/2011	1.5		2.5		0.37	J	21	
White Tank	10/18/2011	2.6		8.1		0.58		33	
White Tank	1/17/2012	2.6		10		0.71		35	
White Tank	4/24/2012	0.56		1.2		0.26	J	7.6	
White Tank	7/24/2012	1.9		9.6		0.68		28	
White Tank	10/23/2012	1.8		9.3		0.53		23	
White Tank	1/15/2013	0.55		1	U	0.18	J	5.3	
White Tank	4/30/2013	1.1		4.5		0.44	J	24	
White Tank	7/23/2013	0.91		5.7		0.34	J	19	
White Tank	10/15/2013	1.5		12		0.46	J	23	
White Tank	1/14/2014	0.16	J	0.94	J	0.5	U	8.4	
White Tank	4/15/2014	0.24	J	0.85	J	0.5	U	7.7	
White Tank	7/8/2014	1.1		6.7		0.36	J	18	

Historical Summary of Compounds of Concern Detected in Basal Groundwater Monitoring Wells and the HCC Well

Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	μG/L	μG/L	μG/L	μG/L	μG/L	
Kunia Well Collected Prior to Start of Basal Remedial Action	10/20/1997	0.04 U	0.92	0.5 U	0.7	0.5 U	
	10/20/97-Dup	0.06	1.1	0.5 U	0.5 U	0.5 U	
	11/24/1997	0.22 J	1.4 J	0.5	0.9	0.5 U	
	12/15/1997	0.13	0.7	0.5 U	0.9	0.5 U	
	1/12/1998	0.16	0.73	1 U	1	1 U	
	5/11/1998	0.16	0.89	0.5 U	0.86	0.5 U	
	7/27/1998	0.21 J	0.64	0.46	0.80	0.27 J	
	2/11/1999	0.14	0.72	0.44 UJ	0.992 UJ	0.279 UJ	
	2/11/99-Dup	0.16	0.82	0.477 UJ	0.994 UJ	0.285 UJ	
	2/1/2000	0.071	0.53	0.407	1.08	0.25	
	7/5/2000	0.087 J	0.68 J	1 U	1.03	1 U	
	1/22/2001	0.087 J	0.53 J	1 U	1.19	1 U	
	6/11/2001	0.095	0.66	1 U	1.10	1 U	
Kunia Well	9/8/2005	0.055	0.49	0.49 J	0.94	0.36 J	Collected during initial startup
	9/14/2005	0.053	0.51	0.50 J	0.96	0.43 J	Day one of 5-day pump test
	9/15/2005	0.061	0.55	0.48 J	0.97	0.38 J	Day two of 5-day pump test
	9/16/2005	0.062	0.61 J	0.47 J	0.95	0.41 J	Day three of 5-day pump test
	9/17/2005	0.061	0.61	0.51 J	1.10	0.41 J	Day four of 5-day pump test
	9/18/2005	0.062	0.63	0.51 J	1.10	0.41 J	Day five of 5-day pump test
	9/23/2005	0.064	0.61	0.54 J	1.20	0.38 J	Week two of Kunia Well pumping
	9/29/2005	0.062	0.52 J	0.52 J	0.80 U	0.36 J	Week three of Kunia Well pumping
	10/24/2005	0.058	0.45	1.0 U	0.80 U	0.14 J	Approx. 5 weeks of Pumping
	11/9/2005	0.058	0.41	0.48 J	1.30	0.40 J	Approx. 7 weeks of Pumping
	1/4/2006	0.027	0.16	0.34 J	0.99	0.28 J	Jan-06 sampling round
	1/10/2006	0.062	0.60	0.39 J	1.30	0.31 J	Three day test of treatment system
	1/11/2006	0.060	0.34	0.51 J	1.50	0.37 J	Three day test of treatment system
	1/12/2006	0.039	0.37	0.45 J	1.40	0.33 J	Three day test of treatment system
	2/7/2006	0.040	0.27	0.46 J	1.40	0.24 J	Monthly
	3/28/2006	0.040	0.28	0.36 J	1.40	0.30 J	Monthly
	4/5/2006	0.038	0.28	1.0 U	1.30	0.36 J	Monthly
	7/11/2006	0.029	0.30	0.41 J	1.60	0.28 J	
	9/19/2006	0.031	0.30	1.0 U	1.80	0.29 J	
	12/5/2006	0.030	0.25	0.36 J	0.80 U	0.28 J	
	3/5/2007	0.030	0.34	0.37 J	1.60	1.0 U	
	6/29/2007	0.036	0.28	0.36 J	1.50	1 U	
	9/12/2007	0.044	0.31	0.34 J	1.40	0.23 J	
	12/26/2007	0.049	0.38	0.36 J	1.90	0.24 J	
	4/9/2008	0.050	0.46	0.35 J	1.30	0.22 J	
	7/23/2008	0.036	0.47	0.44 J	1.40	0.28 J	Quarterly Sample
	1/9/2009	0.020	0.47	0.32 J	0.91	0.21 J	Quarterly Sample
	4/22/2009	0.040	0.58	0.36 J	0.97	0.24 J	Quarterly Sample
	7/9/2009	0.041	0.39	0.35 J	1.00	0.22 J	Quarterly Sample
	10/20/2009	0.025	0.30	0.32 J	1.10	0.25 J	Quarterly Sample
	1/26/2010	*0.110*	*1.10*	*1.1*	1.0	0.19 J	Q Sample - Perched Water Contr. in Line
	2/23/2010	0.023	0.34	0.29 J	1.5	0.19 J	Monthly KWTS sample
	4/20/2010	0.028	0.41	0.34 J	1.3	0.23 J	Start collecting samples at well head
	7/7/2010	0.027	0.44	0.31 J	1.4	0.21 J	
	10/19/2010	0.028	0.49	0.28 J	1.3	0.24 J	
	2/15/2011	0.018 J	0.25	0.31 J	1.5	0.27 J	Jan-11 KWTS Shut down; sampled in Feb-11
	4/26/2011	0.026	0.34	0.36 J	1.6	0.23 J	
	7/27/2011	0.019	0.28	0.34 J	1.4	0.25 J	
							KW pump not working Oct-11 to May-12
	6/6/2012	0.028	0.49	0.32 J	1.5	0.24 J	
	7/24/2012	0.022	0.33	0.36 J	1.6	0.26 J	
	10/10/2012	0.028	0.38	0.42 J	1.2	0.34 J	
	1/8/2013	0.026	0.35 J	0.37 J	1.3	0.31 J	
	4/22/2013	0.019	0.40	0.34 J	1.2	0.28 J	
	7/30/2013			0.38 J	1.3	0.35 J	504.1 Analysis rejected;
	resample in Aug-2013						
	8/26/2013	0.022	0.37				504.1 resampling
	10/21/2013	0.022	0.37	0.43 J	1.3	0.39 J	
	1/22/2014	0.020	0.37	0.35 J	1.3	0.38 J	
							Kunia well under repair Feb - April 2014

Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
BMW-1 2703-02 (Basal Well) Collected During RI	10/23/1997	0.1	0.66	0.5 U	0.7	0.5 U	
	11/20/1997	0.14	0.93	0.5 U	0.5 U	0.5 U	
	12/16/1997	0.11	0.7	0.5 U	0.7	0.5 U	
	1/13/1998	0.14	0.84	1 U	0.8 J	1 U	
	5/12/1998	0.26	0.74	0.51	0.54	0.5 U	
	5/12/98 Dup.	0.26	0.75	0.52	0.61	0.5 U	
	7/27/1998	0.15 J	0.86	0.53 J	0.57 J	0.26 J*	
	7/27/98 Dup.	0.16 J	0.90	0.53 J	0.62 J	0.25 J*	
BMW-1 2703-02 (Basal Well)	2/10/1999	0.12	0.59	0.551 UJ	0.689 UJ	0.278 UJ	
	6/8/1999	0.11	0.67	0.494 UJ	0.623 UJ	0.273 UJ	
	2/1/2000	0.07	0.56	0.445 J	0.835 J	0.26	
	7/5/2000	0.09	0.69	1 U	1 U	1 U	
	1/22/2001	0.10 J	0.57 J	1 U	1.14	1 U	
	6/11/2001	0.085	0.54	1 U	1 U	1 U	
	8/6/2002	0.086	0.55	1 U	1.30	1 U	
	5/19/2003	0.066	0.51	1 U	0.78	0.25	
	12/8/2004	0.068	0.37	0.68 J	0.79 J	0.31 J	
	5/24/2005	0.035	0.29	0.7 J	0.80	0.43 J	
	8/23/2005	0.038	0.30	0.54 J	0.57 J	0.44 J	Prior to Kunia Well Start-up
	9/15/2005	0.036	0.23	0.54 J	0.72 J	0.40 J	Day two of 5-day pump test
	9/16/2005	0.036	0.23	0.52 J	0.77 J	0.36 J	Day three of 5-day pump test
	9/17/2005	0.036	0.23	0.50 J	0.98	0.37 J	Day four of 5-day pump test
	9/18/2005	0.038	0.24	0.48 J	0.68 J	0.42 J	Day five of 5-day pump test
	9/29/2005	0.041	0.26	0.52 J	0.80 U	0.33 J	Week three of Kunia Well pumping
	10/24/2005	0.04	0.27	1.0 U	0.80 U	1.0 U	Approx. 5 weeks of Pumping
	11/9/2005	0.045	0.29	0.42 J	0.97	0.32 J	Approx. 7 weeks of Pumping
	1/5/2006	0.033	0.21	0.40 J	0.77 J	0.25 J	Jan-06 sampling round
	2/7/2006	0.035	0.27	0.43 J	1.10	0.22 J	
	4/5/2006	0.038	0.30	0.37 J	1.10	0.28 J	
	6/30/2006	0.041	0.36	0.39 J	1.30	0.39 J	
	9/13/2006	0.027	0.28	0.35 J	1.60	0.17 J	
	12/19/2006	0.03	0.31	0.37 J	1.60	1.0 U	
	3/21/2007	0.036	0.34	0.30 J	1.50	0.19 J	
	6/29/2007	0.036	0.32	0.38 J	1.30	1 U	
	9/13/2007	0.040	0.34	0.3 J	1.30	0.15 J	
	12/10/2007	0.043	0.27	0.38 J	1.10	0.28 J	
	4/9/2008	0.041	0.44	0.36 J	1.00	0.19 J	
	9/17/2008	0.026	0.30	0.32 J	0.99	0.2 J	Point-source bailer sample henceforth
	10/14/2008	0.017	0.34	0.3 J	0.89	0.18 J	
	1/28/2009	0.023	0.18 J	0.32 J	0.46 J	0.22 J	
	4/20/2009	0.029	0.46	0.32 J	0.71	0.21 J	
	7/6/2009	0.024	0.34	0.28 J	0.88	0.16 J	
	10/19/2009	0.02	0.23	0.30 J	0.91	0.23 J	
	1/26/2010	0.016 J	0.49	0.31 J	0.91	0.21 J	
	4/28/2010	0.021	0.26	0.33 J	1.1	0.5 U	
	7/8/2010	0.019 J	0.49	0.27 J	1.2	0.19 J	
	10/20/2010	0.02 U	0.32	0.27 J	1.1	0.19 J	

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Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
BMW-1 (continued)	1/24/2011	0.017 J	0.29	0.34 J	1.3	0.23 J	
	4/27/2011	0.020	0.26	0.5 U	1.3	0.23 J	
	7/28/2011	0.016 J	0.33	0.28 J	1.2	0.26 J	
	10/20/2011	0.022	0.29	0.29 J	1.1	0.25 J	KW shuts down - Start bi-weekly sampling
	10/31/2011	0.021	0.24	0.37 J	1.1	0.31 J	2 weeks after shut down
	11/14/2011	0.027	0.20	0.44 J	1.1	0.50 U	4 weeks after shut down
	11/28/2011	0.021	0.22	0.38 J	1.2	0.38 J	6 weeks after shut down
	12/12/2011	0.021	0.19	0.38 J	1.0	0.50 U	8 weeks after shut down
	12/27/2011	0.023	0.21	0.31 J	1.0	0.33 J	10 weeks after shut down
	1/11/2012	0.033	0.21	0.38 J	1.1	0.38 J	12 weeks after shut down
	1/24/2012	0.033	0.18	0.47 J	1.0	0.48 J	14 weeks after shut down
	2/9/2012	0.025	0.23	0.39 J	1.1	0.37 J	16 weeks after shut down
	2/23/2012	0.031	0.14	0.5 U	0.6	0.42 J	18 weeks after shut down
	3/8/2012	0.030	0.23	0.35 J	1.2	0.31 J	20 weeks after shut down
	3/19/2012*	0.019 U	0.0096 U	0.33 J	1.2	0.32 J	22 weeks after shut down
	4/26/2012	0.046	0.21	0.52	0.78	0.44 J	Quarterly Sampl. - 27 weeks after shut down
	5/9/2012	0.034	0.30	0.46 J	1.1	0.42 J	29 weeks after shut down
	5/23/2012	0.041	0.15	0.46 J	0.85	0.36 J	31 weeks after shut down
							Restart Kunia Well May 25, 2012
	6/6/2012	0.022	0.44	0.28 J	1.5	0.22 J	approx. 2-weeks after re-start
	6/19/2012	0.024	0.30	0.5 U	1.2	0.42 J	approx. 4-weeks after re-start
	7/16/2012	0.017 J	0.35	0.3 J	1.6	0.2 J	
	10/10/2012	0.016 J	0.34	0.28 J	1.1	0.23 J	
	1/7/2013	0.026	0.18	0.31 J	1.2	0.32 J	
	4/23/2013	0.012 J	0.36	0.32 J	1.1	0.27 J	
	7/30/2013			0.38 J	0.88	0.37 J	504.1 Analysis rejected; resample in Aug-2013
	8/27/2013	0.017 J	0.30				504.1 resampling
	10/22/2013	0.012 J	0.27	0.29 J	1.3	0.26 J	
	1/21/2014	0.014 J	0.34	0.31 J	1.1	0.3 J	
	4/14/2014	0.028	0.32	0.45 J	0.8	0.48 J	

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Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
	12/8/2004	0.092	0.69	0.49 J	2.10	0.26 J	
	5/24/2005	0.062	0.75	0.65 J	2.10	0.46 J	
	8/23/2005	0.071	0.58	0.51 J	1.70	0.48 J	Prior to Kunia Well Start-up
	9/15/2005	0.07	0.49	0.62 J	1.90	0.42 J	Day two of 5-day pump test
	9/16/2005	0.065	0.5	0.48 J	1.80	0.36 J	Day three of 5-day pump test
	9/17/2005	0.075	0.56	0.58 J	2.00	0.43 J	Day four of 5-day pump test
	9/18/2005	0.071	0.59	0.57 J	1.90	0.41 J	Day five of 5-day pump test
	9/29/2005	0.073	0.51	0.57 J	0.80 U	0.34 J	Week three of Kunia Well pumping
	10/24/2005	0.052	0.27	1.0 U	0.80 U	1.0 U	Approx. 5 weeks of Pumping
	11/9/2005	0.076	0.57	0.57 J	1.80	0.35 J	Approx. 7 weeks of Pumping
	1/4/2006	0.044	0.35	0.40 J	1.50	0.27 J	Jan-06 sampling round
	1/4/2006 ,dupl.	0.044	0.34	0.40 J	1.40	0.28 J	Duplicate sample
	2/7/2006	0.044	0.41	0.46 J	2.20	0.20 J	
	4/5/2006	0.042	0.42	1.0 U	2.00	0.26 J	
	4/5/2006 dupl.	0.043	0.43	1.0 U	2.00	0.22 J	Duplicate sample
	6/29/2006	0.049	0.45	0.45 J	2.40	0.18 J	
	6/29/2006 dupl.	0.053	0.50	0.45 J	2.30	0.17 J	Duplicate sample
	9/13/2006	0.026	0.39	0.38 J	2.60	0.16 J	
	9/13/2006 dupl.	0.023	0.31	0.17 U	2.90	0.14 J	Duplicate sample
	12/19/2006	0.036	0.45	0.46 J	2.50	1.0 U	
	12/19/2006 dupl.	0.041	0.41	0.43 J	2.30	1.0 U	Duplicate sample
	3/21/2007	0.050	0.48	0.39 J	2.30	0.21 J	
	3/21/2007 dupl.	0.054	0.50	0.4 J	2.20	0.21 J	Duplicate sample
	6/29/2007	0.045	0.47	0.35 J	1.90	1 U	
	6/29/2007	0.045	0.47	0.41 J	1.90	1 U	Duplicate sample
	9/13/2007	0.071	0.62	0.32 J	1.90	0.18 J	
	9/13/2007	0.071	0.62	0.48 J	2.40	0.17 J	Duplicate sample
	12/10/2007	0.059	0.43	0.39 J	2.20	0.18 J	
	12/10/2007	0.059	0.46	0.36 J	2.30	0.18 J	Duplicate sample
BMW-2							April 2008 no sample, broken pump
	6/24/2008	0.038	0.65 J	0.31 J	1.2	0.13 J	Point-source bailer sample henceforth
	7/23/2008	0.058	0.74	0.56 J	1.6	0.36 J	
	10/14/2008	0.043	0.68	0.48 J	1.6	0.33 J	
	1/28/2009	0.020	0.52 J	0.34 J	1.2	0.18 J	
	1/28/2009	0.021	0.52 J	0.34 J	1.1	0.19 J	Duplicate sample
	4/21/2009	0.064	0.67	0.60	1.3	0.43 J	
	7/6/2009	0.058	0.61	0.46 J	1.6	0.35 J	
	10/19/2009	0.031	0.49	0.36 J	1.3	0.25 J	
	1/26/2010	0.035	0.97	0.37 J	1.2	0.27 J	
	4/28/2010	0.024	0.49	0.30 J	1.5	0.5 U	
	7/8/2010	0.040	0.93	0.39 J	1.6	0.31 J	
	10/20/2010	0.037	0.59	0.41 J	1.6	0.3 J	
	1/24/2011	0.023	0.43	0.35 J	1.7	0.21 J	
	4/27/2011	0.029	0.49	0.34 J	2.0	0.23 J	
	7/27/2011	0.022	0.50	0.35 J	1.6	0.23 J	
	10/20/2011	0.025	0.56	0.3 J	1.8	0.5 U	Kunia Well pump not working Oct-2011 to May-2012
	10/20/2011	0.027	0.58	0.27 J	1.8	0.5 U	duplicate sample
	1/12/2012	0.025	0.46	0.32 J	2.0	0.24 J	
	4/24/2012	0.027	0.45	0.29 J	1.8	0.5 U	
	7/16/2012	0.022	0.45	0.3 J	1.9	0.5 U	
	10/10/2012	0.045	0.45	0.54	1.5	0.45 J	
	1/8/2013	0.032	0.26	0.41 J	2.2	0.46 J	
	1/8/2013	0.033	0.30	0.50	2.4	0.36 J	duplicate sample
	4/23/2013	0.030	0.35	0.80	1.6	0.71	
	7/30/2013			0.63	1.9	0.60	504.1 Analysis rejected; resample in Aug-2013
	8/27/2013	0.042	0.35				504.1 resampling
	10/22/2013	0.029	0.29	0.98	1.5	1.1	
	1/21/2014	0.028	0.39	0.57	1.4	0.54	
	4/14/2014	0.022	0.45	0.42 J	1.3	0.38 J	

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Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
BMW-3	12/8/2004	0.02 U	0.01 U	0.07 U	0.08 U	0.06 U	
	5/24/2005	0.010 U	0.005 U	0.07 U	0.08 U	0.06 U	
	9/13/2005	0.020 UJ	0.010 UJ	1.0 UJ	0.80 UJ	1.0 UJ	
	1/4/2006	0.0011 U	0.00057 U	1.0 U	0.80 U	1.0 U	
	4/5/2006	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	6/29/2006	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	9/13/2006	0.0040 U	0.0023 U	0.17 U	0.27 U	0.12 U	
	12/19/2006	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	3/21/2007	0.010 U	0.0050 U	0.5 U	0.5 U	0.5 U	
	6/29/2007	0.01 U	0.005 U	1 U	0.8 U	1 U	
	9/12/2007	0.01 U	0.005 U	1 U	0.8 U	1 U	
	12/11/2007	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	4/8/2008	0.01 U	0.005 U	1 U	0.8 U	1 U	
	7/21/2008	0.020 U	0.010 U	1.0 U	0.80 U	1.0 U	
	10/13/2008	0.01 U	0.005 U	1 U	0.8 U	1 U	
	1/28/2009	0.02 U	0.01 U	1 U	0.8 U	1 U	
	4/21/2009	0.02 U	0.01 U	0.5 U	0.5 U	0.5 U	
	7/8/2009	0.02 U	0.01 U	0.5 U	0.5 U	0.5 U	
	10/21/2009	0.010 U	0.0050 U	0.50 U	0.50 U	0.50 U	
	1/25/2010	0.020 U	0.010 U	0.50 U	0.50 U	0.50 U	
	4/28/2010	0.019 U	0.0097 U	0.5 U	0.5 U	0.5 U	
	7/8/2010	0.019 U	0.0097 U	0.5 U	0.5 U	0.5 U	
	10/20/2010	0.02 U	0.0098 U	0.5 U	0.5 U	0.5 U	
	1/24/2011	0.02 U	0.0099 U	0.5 U	0.5 U	0.5 U	
	4/25/2011	0.02 U	0.01 U	0.5 U	0.5 U	0.5 U	
	7/28/2011	0.019 U	0.0095 U	0.5 U	0.5 U	0.5 U	
	10/18/2011	0.0095 U	0.048 U	0.5 U	0.5 U	0.5 U	Kunia Well pump not working Oct-2011 to May-2012
	1/11/2012	0.0095 U	0.047 U	0.5 U	0.5 U	0.5 U	
	4/25/2012	0.02 U	0.0099 U	0.5 U	0.5 U	0.5 U	
	7/19/2012	0.02 U	0.0098 U	0.5 U	0.5 U	0.5 U	
	7/19/2012	0.02 U	0.0098 U	0.5 U	0.5 U	0.5 U	Duplicate sample
	10/10/2012	0.019 U	0.0096 U	0.5 U	0.5 U	0.5 U	
	1/8/2013	0.019 U	0.0094 U	0.5 U	0.5 U	0.5 U	
	1/21/2014	0.019 U	0.0096 U	0.5 U	0.5 U	0.5 U	BMW-3 sampled annually in January

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Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
	12/8/2004	0.031	0.25	0.21 J	0.82	0.06 U	
	5/25/2005	0.025	0.22	0.31 J	1.10	1.0 U	
	9/13/2005	0.039 J	0.26 J	0.26 J	0.84 J	1.0 UJ	
	1/4/2006	0.032	0.20	0.19 J	0.77	1.0 U	
	4/5/2006	0.041	0.31	1.0 U	0.94	1.0 U	
	6/29/2006	0.047	0.40	0.29 J	0.98 J	1.0 U	
	9/13/2006	0.038	0.37 J	0.20 J	1.2	0.12 U	
	12/19/2006	0.042	0.39	0.28 J	1.3	1.0 U	
	3/21/2007	0.048	0.42	0.22 J	1.2	0.5 U	
	6/29/2007	0.053	0.37	0.25 J	1.1	1 U	
	9/12/2007	0.053	0.37	0.20 J	1.0	1 U	
	12/11/2007	0.057	0.43	0.23 J	0.99	1.0 U	
	4/9/2008	0.047	0.41	0.26 J	0.84	1 U	
	7/24/2008	0.041	0.42	0.26 J	0.89	1.0 U	
	10/15/2008	0.029	0.36	0.23 J	0.69 J	1 U	
	1/28/2009	0.029	0.33 J	0.2 J	0.66 J	1 U	
	4/21/2009	0.043	0.41	0.2 J	0.78	0.5 U	
	7/9/2009	0.057	0.33	0.21 J	0.96	0.5 U	
	10/22/2009	0.038	0.29	0.19 J	1.0	0.50 U	
	1/27/2010	0.044	0.32	0.21 J	1.3	0.50 U	
	4/28/2010	0.040	0.27	0.23 J	1.4	0.5 U	
	7/8/2010	0.045	0.44	0.19 J	1.0	0.5 U	
	10/20/2010	0.035	0.36	0.19 J	1.0	0.5 U	
	1/24/2011	0.043	0.35	0.21 J	1.3	0.5 U	
	4/25/2011	0.057	0.39	0.5 U	1.4	0.5 U	
	7/28/2011	0.051	0.5	0.22 J	1.5	0.5 U	
	10/18/2011	0.036	0.36	0.23 J	1.4	0.5 U	Kunia Well shuts down - Start bi-weekly sampling
BMW-4	10/31/2011	0.057	0.51	0.22 J	1.2	0.5 U	2 weeks after shut down
	11/14/2011	0.043	0.40	0.5 U	1.3	0.5 U	4 weeks after shut down
	11/28/2011	0.044	0.44	0.5 U	1.4	0.5 U	6 weeks after shut down
	12/12/2011	0.063	0.57	0.5 U	1.4	0.5 U	8 weeks after shut down
	12/27/2011	0.028	0.27	0.5 U	0.9	0.5 U	10 weeks after shut down
	1/11/2012	0.097	0.90	0.27 J	1.7	0.5 U	12 weeks after shut down
	1/11/2012	0.081	0.77	0.27 J	1.6	0.5 U	duplicate sample
	1/24/2012	0.087	0.73	0.28 J	1.6	0.5 U	14 weeks after shut down
	2/9/2012	0.063	0.57	0.5 U	1.4	0.5 U	16 weeks after shut down
	2/23/2012	0.080	0.81	0.5 U	1.3	0.5 U	18 weeks after shut down
	3/8/2012	0.068	0.75	0.21 J	1.3	0.5 U	20 weeks after shut down
	3/19/2012*	0.035	0.18	0.5 U	1.1	0.5 U	22 weeks after shut down
	4/25/2012	0.066	0.66 J	0.5 U	1.4	0.5 U	Quarterly Sampl. - 27 weeks after shut down
	5/9/2012	0.075	0.76	0.30 J	1.1	0.5 U	29 weeks after shut down
	5/23/2012	0.087	0.69	0.26 J	1.3	0.5 U	31 weeks after shut down
							Restart Kunia Well May 25, 2012
	6/6/2012	0.043	0.53	0.20 J	1.1	0.5 U	approx. 2-weeks after re-start
	6/19/2012	0.051	0.50	0.5 U	0.86	0.5 U	approx. 4-weeks after re-start
	7/18/2012	0.038	0.34 J	0.5 U	1.1	0.5 U	
	10/10/2012	0.087	0.69	0.25 J	1.2	0.5 U	
	1/8/2013	0.061	0.54	0.5 U	1.1	0.5 U	
	4/25/2013	0.028	0.30	0.5 U	0.96	0.5 U	
	7/29/2013			0.2 J	1.1	0.5 U	504.1 Analysis rejected; resample in Aug-2013
	8/27/2013	0.041	0.41				504.1 resampling
	8/27/2013	0.031	0.33				Duplicate of re-sample
	10/22/2013	0.042	0.43	0.5 U	1.1	0.5 U	
	1/21/2014	0.064	0.53	0.5 U	0.97	0.5 U	
	4/15/2014	0.049	0.55	0.5 U	0.79	0.5 U	

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Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	μG/L	μG/L	μG/L	μG/L	μG/L	
	5/25/2005	0.023	0.24	0.27 J	1.80	1.0 U	
	9/13/2005	0.031 J	0.26 J	0.22 J	1.3 J	1.0 UJ	
	1/3/2006	0.022	0.17	0.23 J	1.10	1.0 U	
	4/5/2006	0.026	0.23	1.0 U	1.50	1.0 U	
	6/29/2006	0.031	0.26	0.24 J	1.80	1.0 U	
	9/13/2006	0.02	0.22	0.20 J	1.80	0.12 U	
	12/19/2006	0.024	0.21	1.0 U	1.70	1.0 U	
	3/21/2007	0.024	0.22	0.21 J	1.50	0.5 U	
	6/29/2007	0.028	0.18	0.19 J	1.30	1 U	
	9/12/2007	0.031	0.19	0.21 J	1.40	1 U	
	12/11/2007	0.036	0.22	0.24 J	1.40	1.0 U	
	4/8/2008	0.029	0.20	0.24 J	1.20	1 U	
	7/24/2008	0.027	0.22	0.25 J	1.20	1.0 U	
	7/24/2008	0.028	0.21	0.24 J	1.20	1.0 U	Duplicate sample
	10/13/2008	0.020	0.19	0.22 J	0.88	1 U	
	1/27/2009	0.021	0.22 J	0.2 J	0.70 J	1 U	
	4/22/2009	0.026	0.15	0.18 J	0.70	0.5 U	
	7/8/2009	0.036	0.18	0.17 J	0.50 U	0.5 U	
							Oct. 2009 no sample; access to well blocked
BMW-5	1/26/2010	0.016 J	0.17	0.17 J	0.76	0.50 U	
	4/27/2010	0.019 J	0.12	0.17 J	0.86	0.5 U	
	7/7/2010	0.021	0.21	0.16 J	0.85	0.5 U	
	10/18/2010	0.020	0.16	0.17 J	0.84	0.5 U	
	1/24/2011	0.016 J	0.11	0.19 J	1.0	0.5 U	
	4/25/2011	0.020	0.14	0.5 U	1.1	0.5 U	
	7/27/2011	0.017 J	0.15	0.5 U	1.2	0.5 U	
	10/19/2011	0.019	0.20	0.5 U	1.2	0.5 U	Kunia Well pump not working Oct-2011 to May-2012
	1/11/2012	0.019	0.21	0.5 U	1.5	0.5 U	
	4/26/2012	0.018 J	0.28	0.5 U	1.7	0.5 U	
	7/18/2012	0.016 J	0.22	0.5 U	1.7	0.5 U	
	10/8/2012	0.015 J	0.20	0.5 U	1.3	0.5 U	
	1/7/2013	0.020	0.24	0.5 U	1.8	0.5 U	
	4/24/2013	0.011 J	0.20	0.5 U	1.3	0.5 U	
	7/29/2013			0.5 U	1.4	0.5 U	504.1 Analysis rejected; resample in Aug-2013
	7/29/2013			0.5 U	1.3	0.5 U	Duplicate sample
	8/27/2013	0.016 J	0.24				504.1 resampling
	10/21/2013	0.012 J	0.20	0.5 U	1.5	0.5 U	
	1/21/2014	0.013 J	0.28	0.5 U	1.3	0.5 U	
	4/15/2014	0.013 J	0.24	0.5 U	1.4	0.5 U	

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Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
BMW-6	6/29/2007	0.01 U	0.17	0.36 J	1.20	1 U	
	9/12/2007	0.012	0.17	0.32 J	1.20	0.23 J	
	12/11/2007	0.010 U	0.23	0.41 J	1.40	0.30 J	
	4/8/2008	0.0084 J	0.26	0.42 J	1.10	0.3 J	
	7/21/2008	0.0096 J	0.27	0.42 J	1.00	0.33 J	
	10/15/2008	0.01 U	0.26	0.4 J	0.94	0.31 J	
	1/27/2009	0.02 U	0.01 U	0.38 J	0.81	0.3 J	
	4/22/2009	0.02 U	0.26	0.4 J	0.85	0.34 J	
	4/22/2009	0.02 U	0.21	0.36 J	0.89	0.31 J	Duplicate sample
	7/6/2009	0.02 U	0.01 U	0.37 J	0.83	0.27 J	
	7/6/2009	0.02 U	0.01 U	0.35 J	0.86	0.26 J	Duplicate sample
	10/21/2009	0.010 U	0.24	0.40 J	1.1	0.35 J	
	10/21/2009	0.010 U	0.24	0.39 J	1.0	0.33 J	Duplicate sample
	1/27/2010	0.020 U	0.21	0.45 J	1.0	0.26 J	
	1/27/2010	0.020 U	0.21	0.43 J	1.0	0.24 J	Duplicate sample
	4/28/2010	0.02 U	0.24	0.45 J	1.2	0.5 U	
	4/28/2010	0.02 U	0.17	0.44 J	1.2	0.5 U	Duplicate sample
	7/8/2010	0.019 U	0.44	0.55	1.3	0.35 J	
	7/8/2010	0.02 U	0.39	0.52	1.5	0.33 J	Duplicate sample
	10/18/2010	0.02 U	0.37	0.49 J	1.4	0.36 J	
	10/18/2010	0.02 U	0.38	0.49 J	1.4	0.35 J	Duplicate sample
	1/24/2011	0.02 U	0.24	0.58	1.6	0.4 J	
	1/24/2011	0.02 U	0.26	0.61	1.5	0.44 J	Duplicate sample
	4/25/2011			0.5	1.7	0.42 J	504.1 bottles not submitted
	4/25/2011	0.019 U	0.24	0.47 J	1.6	0.43 J	Duplicate sample
	7/27/2011	0.019 U	0.29	0.51	1.6	0.4 J	
	7/27/2011	0.019 U	0.27	0.55	1.6	0.4 J	Duplicate sample
	10/18/2011	0.0096 U	0.25	0.49 J	1.5	0.39 J	Kunia Well pump not working Oct-2011 to May-2012
	1/11/2012	0.0097 U	0.22	0.42 J	1.5	0.41 J	
	4/24/2012	0.02 U	0.097	0.43 J	1.4	0.35 J	
	7/16/2012	0.02 U	0.25	0.49 J	1.7	0.36 J	
	10/9/2012	0.019 U	0.25	0.52	1.4	0.45 J	
	10/9/2012	0.019 U	0.21	0.52	1.3	0.42 J	Duplicate sample
	1/7/2013	0.0052 J	0.24	0.49 J	1.7	0.37 J	
	3/19/2013	0.019 U	0.25	0.62	1.7	0.36 J	
	4/23/2013	0.019 U	0.19	0.47 J	1.3	0.34 J	
	4/23/2013	0.019 U	0.21	0.48 J	1.3	0.34 J	Duplicate sample
	5/21/2013	0.019 U	0.14	0.46 J	1.4	0.2 U	
	7/29/2013			0.46 J	1.2	0.35 J	504.1 Analysis rejected; resample in Aug-2013
	8/27/2013	0.019 U	0.20				504.1 resampling
	10/22/2013	0.019 U	0.20	0.53	1.5	0.46 J	
	10/22/2013	0.019 U	0.18	0.46 J	1.2	0.43 J	Duplicate sample
	1/21/2014	0.019 U	0.27	0.52	1.3	0.39 J	
	4/14/2014	0.019 U	0.22	0.4 J	1.2	0.37 J	
	4/14/2014	0.019 U	0.23	0.41 J	1.4	0.37 J	Duplicate sample
BMW-7	1/7/2013	0.032	0.17	0.24 J	3.0	0.28 J	
	3/19/2013	0.025	0.22	0.36 J	3.1	0.2 J	
	4/23/2013	0.025	0.22	0.29 J	2.1	0.23 J	
	5/21/2013	0.025	0.19	0.34 J	2.9	0.28 J	
	7/30/2013			0.31 J	2.5	0.37 J	504.1 Analysis rejected; resample in Aug-2013
	8/27/2013	0.04	0.23				504.1 resampling
	10/22/2013	0.027	0.19	0.24 J	2.5	0.23 J	
	1/21/2014	0.032	0.27	0.29 J	2.7	0.24 J	
	1/21/2014	0.038	0.26	0.29 J	2.3	0.23 J	Duplicate sample
	4/14/2014	0.035	0.33	0.24 J	1.9	0.23 J	

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Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	*0.04 HI MCL*	*0.04 HI MCL*	*5 MCL*	*0.6 HI MCL*	*5 MCL*	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
DLNR Mauka Deep Well	5/26/2005	0.013	0.05	0.16 J	0.71 J	1.0 U	
	9/14/2005	0.014 J	0.043 J	1.0 UJ	0.33 J	1.0 UJ	
	1/3/2006	0.020 U	0.020	1.0 U	0.80 U	1.0 U	
	4/18/2006	0.0051 J	0.0042 J	1.0 U	0.80 U	1.0 U	
	6/28/2006	0.010 U	0.0069	1.0 U	0.80 U	1.0 U	
	9/12/2006	0.0040 U	0.0023 U	0.17 U	0.29 J	0.12 U	
	12/18/2006	0.015	0.067	1.0 U	0.79 J	1.0 U	
	3/12/2007	0.010 U	0.0050 U	1.0 U	0.23 J	1.0 U	
	6/25/2007	0.0054 J	0.021	1 U	0.24 J	1 U	
	9/11/2007	0.014	0.029	1 U	0.57 J	1 U	
	12/12/2007	0.010 U	0.011	1.0 U	0.45 J	1.0 U	
	4/7/2008	0.023	0.081	0.16 J	0.48 J	1 U	
	7/22/2008	0.0085 J	0.024	1.0 U	0.38 J	1.0 U	
	10/14/2008	0.020	0.086	0.15 J	0.44 J	1 U	
	1/26/2009	0.0041 J	0.013 J	0.13 J	0.31 J	1 U	
	4/22/2009	0.02 U	0.017	0.085 J	0.26 J	0.5 U	
	7/7/2009	0.0071 J	0.023	0.093 J	0.32 J	0.5 U	
	10/20/2009	0.0061 J	0.017	0.10 J	0.32 J	0.50 U	
	1/27/2010	0.0093 J	0.039	0.084 J	0.39 J	0.50 U	
							Not Sampled April 2010 - No well access
	7/6/2010	0.022	0.095	0.11 J	0.44 J	0.5 U	
	10/19/2010	0.027	0.09	0.13 J	0.56	0.5 U	
	1/26/2011	0.017 J	0.061	0.14 J	0.46 J	0.5 U	
							April and July 2011 No Access to the Well
	10/19/2011	0.022	0.085	0.5 U	0.52	0.5 U	
	1/10/2012	0.023	0.10	0.5 U	0.51	0.5 U	
	4/25/2012	0.0059 J	0.03	0.5 U	0.5 U	0.5 U	
	7/17/2012	0.019 J	0.08	0.5 U	0.5	0.5 U	
	10/9/2012	0.018 J	0.065	0.5 U	0.46 J	0.5 U	
	1/21/2014	0.0087 J	0.07	0.5 U	0.36 J	0.5 U	DLNR wells sampled annually in January
DLNR Ewa-Kunia Middle Deep Well	2/11/2003	0.020 U	0.01 U	1.0 U	0.80 U	1.0 U	
	5/26/2005	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	1/3/2006	0.0011 U	0.00057 U	1.0 U	0.80 U	1.0 U	
	4/5/2006	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	6/28/2006	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	9/12/2006	0.0040 U	0.0023 U	0.17 U	0.27 U	0.12 U	
	12/18/2006	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	3/12/2007	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	6/25/2007	0.01 U	0.005 U	1 U	0.8 U	1 U	
	9/11/2007	0.01 U	0.005 U	1 U	0.8 U	1 U	
	12/12/2007	0.010 U	0.0050 U	1.0 U	0.80 U	1.0 U	
	4/7/2008	0.01 U	0.005 U	1 U	0.8 U	1 U	
	7/22/2008	0.020 U	0.010 U	1.0 U	0.80 U	1.0 U	
	10/14/2008	0.01 U	0.005 U	1 U	0.8 U	1 U	
	1/26/2009	0.02 U	0.01 U	1 U	0.8 U	1 U	
	4/22/2009	0.02 U	0.01 U	0.5 U	0.5 U	0.5 U	
	7/7/2009	0.02 U	0.01 U	0.5 U	0.5 U	0.5 U	
	10/20/2009	0.010 U	0.0050 U	0.50 U	0.50 U	0.50 U	
	1/27/2010	0.020 U	0.010 U	0.50 U	0.50 U	0.50 U	
	4/27/2010	0.02 U	0.0098 U	0.5 U	0.5 U	0.5 U	
	7/6/2010	0.019 U	0.0097 U	0.5 U	0.5 U	0.5 U	
	10/19/2010	0.02 U	0.0099 U	0.5 U	0.5 U	0.5 U	
	1/26/2011	0.02 U	0.0098 U	0.5 U	0.5 U	0.5 U	
	4/27/2011	0.02 U	0.0099 U	0.5 U	0.5 U	0.5 U	
	7/27/2011	0.019 U	0.0096 U	0.5 U	0.5 U	0.5 U	
	10/19/2011	0.0097 U	0.049 U	0.5 U	0.5 U	0.5 U	
	1/10/2012	0.0096 U	0.048 U	0.5 U	0.5 U	0.5 U	
	4/25/2012	0.02 U	0.0099 U	0.5 U	0.5 U	0.5 U	
	4/25/2012	0.02 U	0.0098 U	0.5 U	0.5 U	0.5 U	Duplicate sample
	7/17/2012	0.02 U	0.0099 U	0.5 U	0.5 U	0.5 U	
	10/9/2012	0.019 U	0.0096 U	0.5 U	0.5 U	0.5 U	
	1/21/2014	0.019 U	0.0096 U	0.5 U	0.5 U	0.5 U	DLNR wells sampled annually in January

Golder Associates

Well	Sample Date	504 - EDB/DBCP		8260 - VOLATILE ORGANICS			Comments
	Compound	EDB	DBCP	1,2-DCP	1,2,3-TCP	TCE	
	Cleanup Level=	0.04 HI MCL	0.04 HI MCL	5 MCL	0.6 HI MCL	5 MCL	
	Sample Date	µG/L	µG/L	µG/L	µG/L	µG/L	
HCC	11/5/1997	0.04 U	0.04 U	0.5 U	0.5 U	0.5 U	
	2/17/1998	0.02 U	0.04	1 U	1 U	1 U	
	5/11/1998	0.025	0.07	1 U	1 U	1 U	
	7/1/1998	0.019 J	0.06	0.143 J	0.216 J	1 U	1997 to July 1998 samples collected during RI
Hawaii Country Club (HCC)	7/21/1998	0.04 U	0.02 U	NA	NA	NA	1998 to 2008 HDOH Sample Results
	8/25/1998	0.01 U	0.06	NA	< 0.5 J	NA	
	12/1/1998	0.01 U	0.06	NA	<0.5 J	NA	
	3/16/1998	0.01 U	0.06	NA	<0.5 J	NA	
	4/21/1999	0.04 U	0.06	NA	<0.5 J	NA	
	2/8/2000	< 0.04 J	0.07	0.3 U	0.2 U	0.2 U	
	5/11/2000	<0.04 J	0.08	0.3 U	0.31	0.2 U	
	6/9/2000	0.3 U	0.3 U	0.3 U	0.2 U	0.2 U	
	8/14/2000	<0.04 J	0.07	0.3 U	0.27	0.2 U	
	10/12/2000	<0.04 J	0.08	0.3 U	0.3	0.2 U	
	2/26/2001	<0.04 J	0.07	0.3 U	0.27	0.2 U	
	5/8/2001	<0.04 J	0.08	0.3 U	0.28	0.2 U	
	7/11/2001	<0.04 J	0.06	0.3 U	0.28	0.2 U	
	11/28/2001	0.01 U	0.07	NA	0.27	NA	
	2/22/2002	<0.04 J	0.08	NA	0.36	NA	
	6/3/2002	0.01 U	0.07	0.3 U	0.27	0.2 U	
	7/30/2002	<0.04 J	0.07	NA	0.3	NA	
	11/14/2002	<0.04 J	0.07	NA	0.29	NA	
	1/27/2003	<0.04 J	0.08	NA	0.32	NA	
	6/3/2003	<0.04	0.07	NA	0.28	NA	
	8/12/2003	<0.04	0.07	NA	0.3	NA	
	10/7/2003	<0.04	0.06	NA	0.25	NA	
	2/9/2004	<0.04	0.07	NA	0.31	NA	
	5/6/2004	<0.04	0.08	NA	0.3	NA	
	8/17/2004	<0.04	0.07	NA	0.29	NA	
	10/14/2004	<0.04	0.09	NA	0.36	NA	
	1/25/2005	<0.04	0.08	NA	0.29	NA	
	5/23/2005	<0.04	0.06	NA	0.27	NA	
	8/26/2005	<0.04	0.08	NA	0.3	NA	
	12/2/2005	<0.04	0.04	NA	0.17	NA	
	3/8/2006	<0.04	0.06	NA	0.26	NA	
	5/18/2006	<0.04	0.07	NA	0.27	NA	
	8/25/2006	<0.04	0.09	NA	0.4	NA	
	12/4/2006	<0.04	0.09	NA	0.38	NA	
	2/20/2007	<0.04	0.08	NA	0.39	NA	
	4/18/2007	<0.04	0.09	NA	0.43	NA	
	7/17/2007	<0.04	0.09	NA	0.46	NA	
	2/20/2008	<0.04	0.10	NA	0.44	NA	Last HDOH Collected Sample
Hawaii Country Club (HCC)	1/22/2014	0.011 J	0.12	0.5 U	0.42 J	0.5 U	Start of Golder collecting at well head.
	4/14/2014	0.012 J	0.13	0.5 U	0.42 J	0.5 U	

Notes:
HI MCL - State of Hawaii Administrative Rule Title 11, Chapter 11-20
MCL - Maximum Contaminant Level EDB= Ethylene Dibromide
U - Analyte was not detected above the given sample reporting limit DBCP=
Dibromochloropropane J - Estimated Value 1,2-DCP= 1,2-
Dichloropropane Shading indicates compound was detected in excess of Cleanup Level. 1,2,3-
TCP= 1,2,3-Trichloropropane Blank spaces indicates analyte was not tested for in that sample.
TCE= Tricloroethylene

NA - Not Analyzed
*The 3/19/2012 EDB and DBCP results under the EPA method 504.1 analysis are abnormally low.